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October 1982/$2.00

# WEEDS TREES & TURF

The Journal of Landscape and Golf Course Design, Construction and Care Since 1962

## How Compaction Robs Golf Tees; Fream

## Seed Growers see Recovery in Restocking

## Special Districts Bolster City Landscapes

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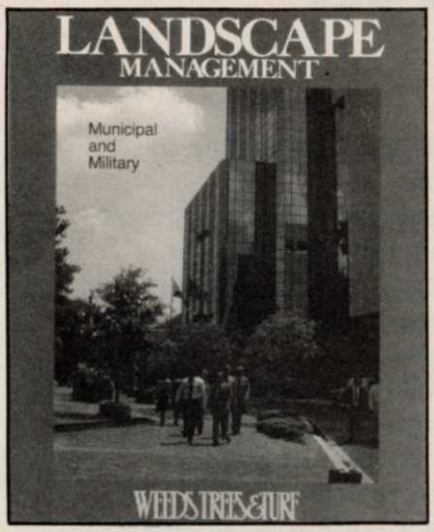
WT&T

Cover: Tampa citizens are fortunate to have well-groomed green areas within the city. See Tampa Uses Computer on page 50.

OCTOBER 1982/VOL. 21, NO. 10

Fight compaction problems on tees, see page 24.




City landscape management, see page 37.

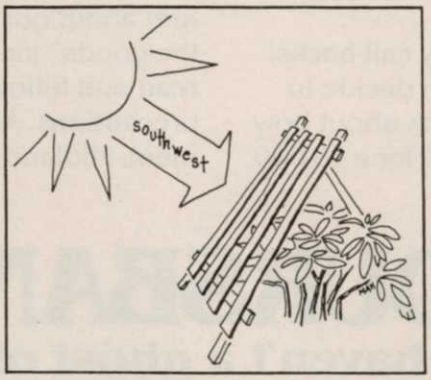
Turf block parking lot in LA, see page 45.

## 24
## Compaction Robs Golf Courses Of Natural Tees

Golf course architect Ron Fream begins a three-part series on compaction and the golf course. The specifications and precautions for tee construction and care are the focus of part one.

## 29
## Seed Growers Link Recovery To Restocking

An improving economy may help out seed growers who experienced good seed harvests this summer despite lagging demand. Harvest results by variety are listed and company spokesmen give their opinions on the seed situation.




Winter protection of landscapes, see page 56.

## 37
## Landscape Management Profile: Municipal and Military

Growth of special districts could bolster city landscapes as budgets tighten. Survey results show there is considerable overlap in municipal and park landscape management.

## 56
## Combat Winter's Fury With Simple Precautions

Dow Garden Horticulturist Doug Chapman cautions about dessication, wind and sun scald, and winter pest control. Included is a list of salt tolerant plants for use near paved surfaces. Compare your protection program to Doug's suggestions.

## DEPARTMENTS

Outlook 4
Green Industry News 6
Golf Update 8
Landscape Update 10
Government Update 10
Vegetation Management 20
Events 61
Products 62
Classifieds 64
Advertiser Information 66

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WEEDS TREES & TURF (ISSN 0043-1753) is published monthly by Harcourt Brace Jovanovich Publications. Corporate and Editorial offices: 757 Third Avenue, New York, New York 10017. Advertising offices: 757 Third Avenue, New York, New York 10017 and 111 East Wacker Drive, Chicago, Illinois 60601 and 3091 Maple Drive, Atlanta, Georgia 30305. Accounting, Advertising Production and Circulation offices: 1 East First Street, Duluth, Minnesota 55802. Subscription rates: $15 per year in the United States; $18 per year in Canada. All other countries: $40 per year. Single copies (prepaid only): $2 in the U.S.; elsewhere $4.50; add $3.00 for shipping and handling per order. Second class postage paid at Duluth, Minnesota 55806 and additional mailing offices. Copyright © 1982 by Harcourt Brace Jovanovich, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher. Microfilm copies of articles are available through University Microfilms, International, 300 N. Zeeb Road, Ann Arbor, Michigan 48106.

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WT&T

# OUTLOOK

**By Bruce F. Shank, Executive Editor**

## Bullish is better

The other evening during my ritual pre-dusk weed pulling, I noticed my stockbroker neighbor walking around his yard kicking rocks and talking to himself. It made no sense. That week the market turned around and stunned Wall Street with record volume. Stockbrokers should be celebrating.

Since journalists are born nosey, I dropped my handful of clover and ground ivy and crossed the street for an explanation. What I found out surprised me, recovery can be bad for some people.

My neighbor's firm decided the market was not going to hold and went "short". They expected their customers to buy less stock than the market seemed to indicate. Rather than gamble on buying too much stock in advance of its customers and make a profit, the firm's buyers decided to wait. As a result, it was caught short when orders did come in forcing the firm to buy stock to fill orders at a loss. It sounds more complicated than it is. Anyway, in one day his firm lost $400,000 and the market was still bullish making further losses likely.

I returned to my weeds and pondered similar events in the professional turf and landscape market, my bread and butter. I had two reasons to feel good, my garden looked almost professional and the turf and landscape markets were showing signs of faith in recovery. Discussions that week with major companies in our market revealed a commitment to a good '83. They are investing in the goods required to grow instead of holding up short.

Interest rates are dropping. Building starts are beginning to turn around. Many companies have trimmed down to fighting weight and are ready to wrestle for new business. Each week I hear more about new products, new plans, and people working on their business skills. As the show season begins, everyone appears to have a positive attitude and a desire to succeed in '83.

The point is bullish is better. Wait for proof of recovery and, ironically, you stand to lose. Confidence in growth by itself is a third of the battle. It's more than a gamble, the confidence factor tips the scale in favor of success.

Last night I tried to talk to my neighbor for an update. Unfortunately his firm is still suffering from a lack of confidence. He didn't even want to talk about it. I thought, if they had at least taken a chance on the good side and things went sour, then at least they could say they thought like winners instead of losers. As it stands now, they lost twice.

As for me, my garden looks great and my market is thinking like winners.

## Rolling stone gathers no moss

After two short years in New York, *Weeds Trees & Turf* returns to the Midwest, to Middleburg Heights, Ohio and a brand spanking new building. In fact, Harcourt Brace Jovanovich, is also building in Orlando, Florida. As of this month, WTT's new address is 7500 Old Oak Blvd., Middleburg Heights, OH, 44130. (216) 243-8100.

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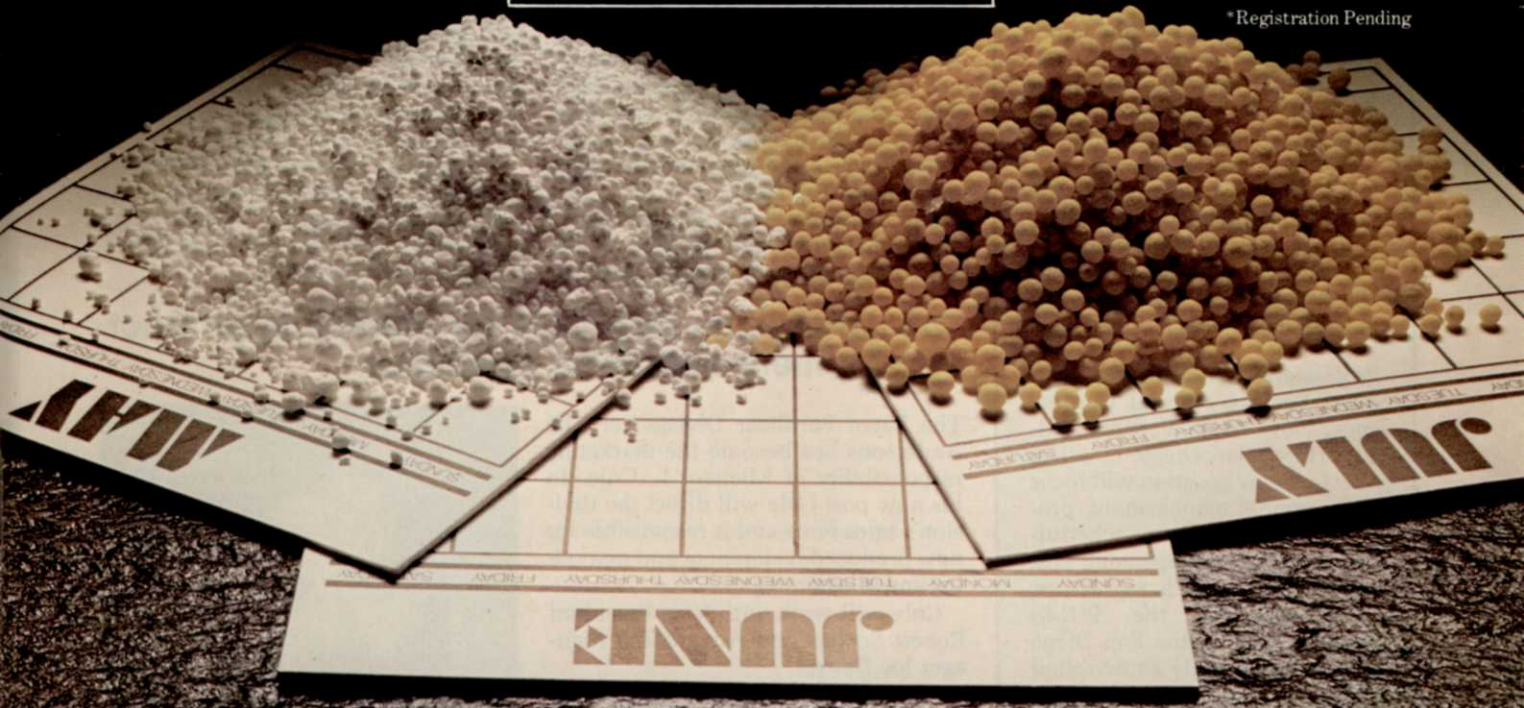

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# GREEN INDUSTRY NEWS

## GCSAA Atlanta show has broader scope

It may be a turf show, but the 54th Interational Turfgrass Conference and Show this February in Atlanta will go beyond typical turf topics to include sessions on lawn care, taxes, dealing with unions, and even clothing for the superintendent.

"We're sending up a number of trial ballons," says Jim Prusa, director of education for the Golf Course Superintendents Association of America. "Superintendents should know more about non-golf subjects."

At the same time, GCSAA has preserved and expanded bread and butter sessions such as the Thinking Superintendent and Research Update. Sixteen turf researchers and 32 superintendents will give brief updates on methods to improve their jobs.

The seminar series, held in previous years on the weekend before the show, will also be held during the week for early risers and on the final days of the show. The show begins at the Georgia World Congress Center in Atlanta on Monday, February 21, and ends Friday, Feb. 25. Seminars begin Saturday, Feb. 19.

GCSAA has invited both Senator Robert Dole (R-KS) and Agriculture Secretary Richard Block to keynote the conference. ChemLawn Vice President Robert Miller will cover developments regarding 2,4-D during the lawn care session on Wednesday. Superintendents will depart the conference with insight to the government workings which affect them.

The seminar series has been expanded to include golf car fleet operations, retirement planning, leadership and motivational theories, computers and the golf course, and labor relations. The United States Golf Association Green Section will again present its morning session on rules, course rating system, and regional golf course problems.

Golf course basics will be covered in sessions on turfgrass identification and management, ornamental and turf pests, and plant and soil nutrition. A five-hour session on golf course design is also scheduled.

More than 220 booths have been contracted to suppliers for the industry's largest display of turf equipment and supplies. Both GCSAA and *Weeds Trees & Turf* will have show dailies to keep showgoers informed and on time.

The annual preconference golf tournament will take place at Myrtle Beach on Feb. 17 and 18. Complete show information will be mailed by GCSAA in mid-October. The association has increased the participation of regional newsletters in the show. A newsletter editor session was held in Lawrence, KS, in September to help the word on the show get out to everyone.

Interested persons should contact GCSAA if they have not received a registration packet by late October. The address is 1617 St. Andrews Drive, Lawrence, KS 66044.

## COMING SOON

**National Landscape Maintenance Conference,** Nov. 7-9, Marriott Market Center, Dallas, TX. Sponsored by the Associated Landscape Contractors of America, the new conference will focus on reports from national leaders in the industry, including contractors, specifiers, and corporation representatives, who will assess the state of the maintenance industry and its future. All sessions are developed specifically for maintenance contractors. Highlights include marketing and image building, management development, job estimating, use of maintenance equipment, and personnel development. Contact ALCA, 1750 Old Meadow Rd., McLean, VA 22102. (703) 821-8611.

**Professional Grounds Management Society** Annual Conference, Nov. 14-18, Vacation Village Hotel, San Diego, CA. The new four-day program will focus on personnel management, preventive maintenance, scheduling, irrigation management, pest control and growth regulators. Presentation of the PGMS Awards, tours of the San Diego area, and the trade show round out the event. Extra time for sightseeing is planned. Contact Allan Shulder, PGMS, 7 Church Lane, Pikesville, Md, 21208. (301) 653-2742.

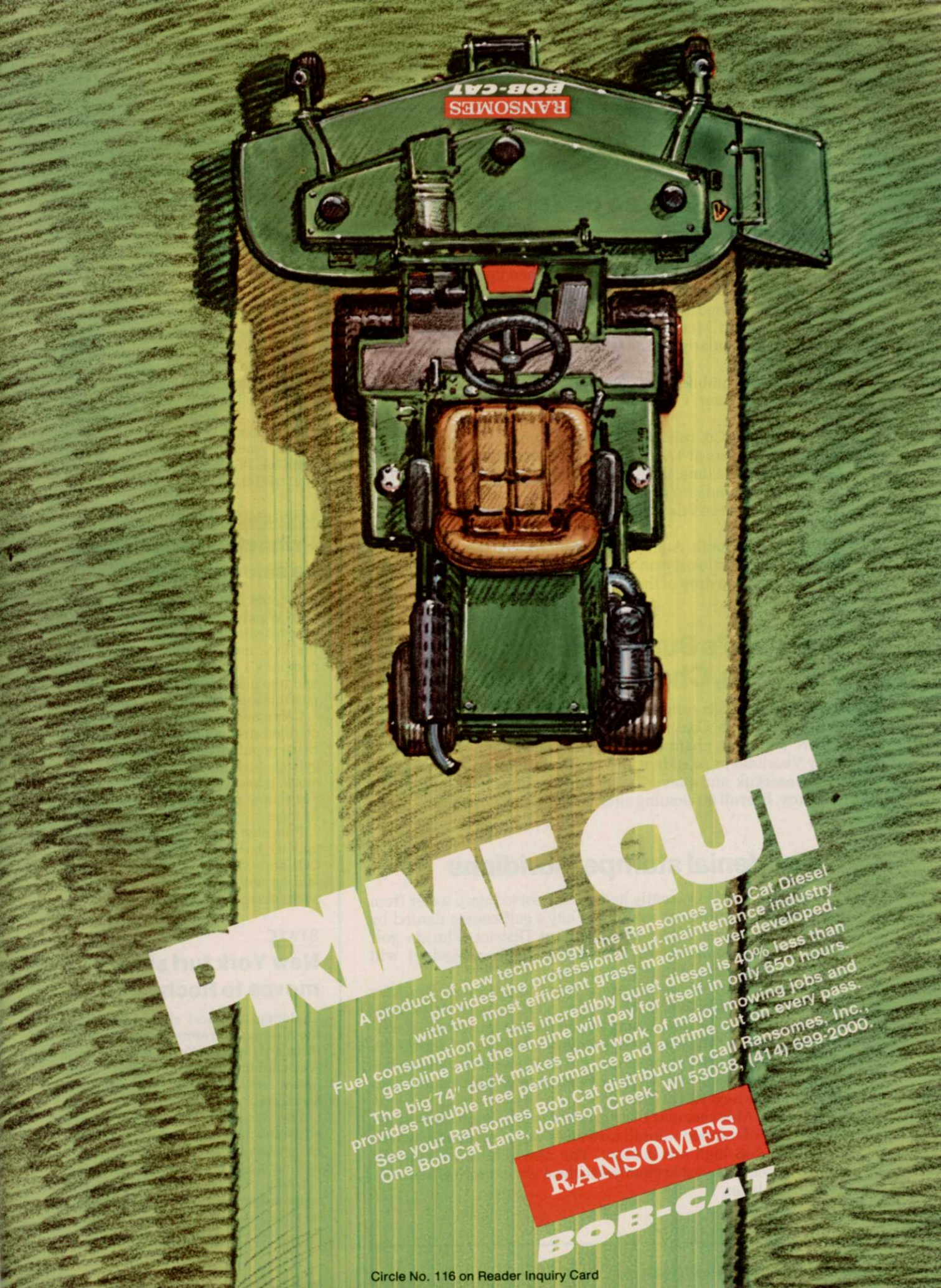
## The Andersons pick Cole for marketing product development and sales strategies

The Lawn Fertilizer Division or The Andersons has become the marketing responsibility of Michael L. Cole. In his new post Cole will direct the division's sales force and is responsible for new product development and marketing and sales strategies.

Cole will work with Vice President Robert Scobee and Advertising Manager Joe Deluca.

The Andersons has developed more than 500 products since its inception in 1962. Cole joined the company in 1981 and has previously held marketing posts for J.I. Case.

Michael Cole

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# GOLF UPDATE

## Joe Much moves up for NGF

Joe Much, popular director of western field operations for the National Golf Foundation, is being kicked upstairs to Director of Field Services and will move to NGF headquarters in North Palm Beach, FL.

Much, 59, joined the Foundation field staff in 1968 and currently resides in Monmouth, OR. A former sportswriter, Much pens articles regularly for the Golf Market Report and PGA Magazine.

Bob Slausen, publisher of *The Middle Tee*, takes Much's place as western director. Golfer numbers grow to more than 17 million.

A.C. Nielson Co. released in August figures placing the number of U.S. golfers at 17,367,000, an increase of 9.2 percent since 1979. At the same time, the National Golf Foundation reports second quarter rounds up an average of 8.5 percent over 1981, the largest increase recorded since NGF started quarterly analysis in 1978.

Play in the South Atlantic states increased the most at 13.2 percent. The Northeast gain was very modest and the West North Central showed a drop of three percent.

## Standard's Burrell resigns, Voorhees, Champion named

Steve Burrell has resigned as president and marketing director of Standard Golf Co., manufacturer of golf course accessories. Robert Voorhees, chairman, has announced the appointment of Peter Voorhees as president and Jim Champion as sales director. Bob Waseskuk and Steve Tyler will continue to represent the company. Burrell is pursuing alternative career interests.

## Water denial stumps Floridians

Sebastian, Florida recently had its request to pump water from the Floridian Aquifer for use on the city's golf course denied by the St. John River Water Management District. Florida golf course superintendents are wondering if this precedent will affect development of future golf courses in the state.

An editorial by Superintendent Jim Callaghan of Rio Mar Country Club, Vero Beach, Fl., in *Georgia Turfgass News* indicates a trend may be developing in water use requests for southern golf courses. "We may have to bite the bullet and accept the fact that golf is played on grass and not lush greenery that has become commonplace. We will be responsible to educate our club officials to this new fact of life.

The Water Management District felt the club should have studied the used of trapped rainfall instead of wells, especially where the aquifer has high salt content. The newly built course may have to be restructured to channel surface water more effectively into surface lakes.

**NEWS** *from page 6*

SPORTS TURF

## Parks show adds sports turf meet

The 12th Annual National Institute on Parks and Grounds Management will include for the first time a concurrent program by the Sports Turf Managers Association. The sports turf group was created in 1981 and is managed by the same group as NIPGM.

The theme of the conference is "Technology in the 80's". The program will utilize "experts in applied technology and professionals who have experience in new systems to present the practical facts, costs, problems, and advantages." A computer workshop is also planned.

For more information contact NIPGM, PO Box 1936, Appleton, WI, 54911. (414) 733-2301.

MANUFACTURING

## Princeton adds dealers as sales pick up

Princeton Manufacturing Co. president Woodrow Wilson has announced an expansion in his dealer program in the U.S. and Canada as sales of the company's sod harvesters, forklifts, and tree planters turned upward in the past three months.

Company spokesman Tom Chupka credited strength in sales overseas and rising popularity of the company's Piggyback forklift for Princeton's optimism. It has an office in London which distributes machinery to all parts of Europe.

Princeton, based in Canal Winchester, OH, has new dealers in Longmont, CO, and Mt. Hope, Ontario. Wilson said he will make further new dealer announcements very soon.

STATE

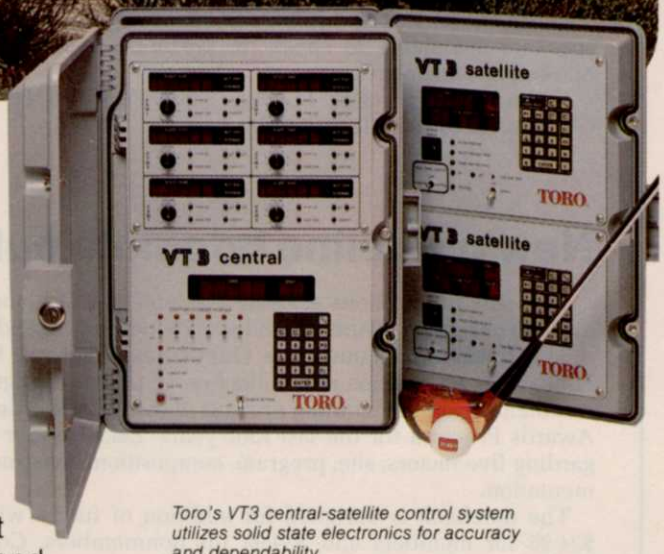
## New York turf show moves to Rochester

Updating technical skills and getting the most out of resources are the main thrusts of the New York State Turfgrass Association Conference and Trade Show, Nov. 9-11 at the Rochester War Memorial.

The location of the conference alternates between eastern and western portions of New York to provide all turf managers in the state a convenient location. The show is produced in cooperation with Cornell University's agronomy department.

*Continued on page 10*

# 9 of the top 10 golf courses in America have Toro® irrigation

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# LANDSCAPE UPDATE

## Deadline nears for residential award program

Entries for the National Landscape Association's 13th Annual National Residential Award Program must reach NLA by November 1. The contest is open to all professionals who created design or performed the installation or maintenance. Categories for entry are single family residences, entrance areas, active use areas, and passive use areas. To obtain entry form contact NLA, 230 Southern Building, Washington, D.C. 20005. (202) 737-4060.

## Earl Butz to keynote PLCAA show

The controversial former secretary of agriculture Earl Butz will expound upon free enterprise in the 80's as the keynote speaker for the Professional Lawn Care Association of America convention and trade show Nov. 16-18, Indianapolis, IN.

Butz, U.S. Secretary of Agriculture from 1971-1976, has been a popular speaker since his departure from office under fire. He strongly defends the need for profits for agriculture and other businesses. Populism, Politics and Progress is the title of his presentation.

The PLCAA show also features the largest collection of equipment, chemicals and supplies for lawn application and maintenance. Panel discussions on major topics have also been very popular. ChemLawn Vice President Robert Miller will speak on the 2,4-D situation. Other speakers are slated to speak on personnel management, budgeting, marketing, and organization.

Contact Jane Stecker, PLCAA, Suite 1717, 435 N. Michigan Ave., Chicago, IL. 60611. (312) 644-0828.

## New guideline booklets published

Two new publications are now available to assist landscape contractors with designing, planning, and specifying exterior and interior work.

The Residential Landscape Guidelines Notebook by the National Landscape Association is a collection of photos, design drawings, and commentary on the winning projects of the NLA Residential Landscape Awards Program for the last four years. Each winner is discussed regarding five factors; site, program, composition, construction and implementation.

The notebook is designed for addition of future winners and costs $24.95 for members and $34.95 for nonmembers. Contact NLA, 230 Southern Building, Washington, DC 20005.

The third edition of the Guide to Specifications for Interior Landscaping has been released by the Interior Landscape Division of the Associated Landscape Contractors of America. The new edition features 56 color illustrations of interior plants, updated standards, and a detailed discussion of contractual, installation, and maintenance practices. Like previous editions, the Guide contains specifications for lighting requirements, pot sizes, soil mixes, pH, and other factors of interior landscapes.

The Guide is available to ALCA members for $20 and nonmembers for $30. Contact Interior Landscape Division, ALCA, 1750 Old Meadow, Rd., McLean, VA 22102.

**NEWS** *from page 8*

Technical updates will concern growth regulators, weed control, turfgrass selection, sand topdressing, and Poa annua. Breakout sessions focus on the specific needs of golf, athletic fields, and lawn care. The final day of the conference offers a workshop and exam for pesticide recertification.

The conference is also a good place to start planning equipment and supply needs for the coming year. Manufacturers and regional distributors exhibit at the NYSTA Show.

Contact Ann Reilly, Nysta, 210 Cartwright Blvd., Massapequa Park, NY 11762. (516)541-6902.

TURF

## Warren's adds Trevira to growing products

Hoechst Fibers Industries has appointed Warren's Turf Nursery, Inc., as national distributor for Trevira Spunbond fabric for recreational and horticultural use. Warren spokesman Emory Hunter said the fabric represents expansion of the company's product line which now includes sod, seed, and the T-7 spreader.

Trevira Spunbond is a nonwoven, continuous filament polyester fabric which can be used to line sandtraps to prevent soil/sand mixing, to provide erosion control, lining greens during construction, reinforcing cart paths, and to line pond bottoms.

"Warren's is diversifying and consolidating its product line for turf and golf course uses," says Hunter. "Two more products will be announced in the near future, Turf-Kote, a nutrient-coated lawn seed, and Adventure, a new turf-type tall fescue. Our present dealers across the U.S. will be carrying a broader line of Warren's products, and we will be establishing more dealers in the near future."

EQUIPMENT

## Carswell elected OPEDA president

Robert Carswell was elected president of the Outdoor Power Equipment Distributors Association during their annual meeting in Miami, FL. He is president of Carswell Distributing Co. of Winston-Salem, NC. Accepting the office, Carswell praised the work of the outgoing president Joseph Porter and pledged to continue the new member drive started last year.

*Continued on page 18*

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**340 - CONSTRUCTION DESIGN FOR LANDSCAPE ARCHITECTS**
by Albe E. Munson
Design specifications for layout, grading, drainage, structures and irrigation. Also explains mathematics of drafting. **$34.50**

**345 - COST DATA FOR LANDSCAPE CONSTRUCTION 1982**
Kathleen W. Kerr, Editor
An updated unit cost data reference for designers and cost estimators. Developed to fill the tremendous need for detailed landscape construction cost data. Laid out in easy-to-use CSI format. Annual. **$27.50**

**335 - LANDSCAPE DESIGN THAT SAVES ENERGY** by Anne Simon Moffat and Marc Schiler
Practical guide to landscaping a home or office to reduce space heating needs by as much as 30 percent annually. Contains specific planning strategies for the four main climatic zones of the continental United States. **$9.95 paperback**

**385 - TREES FOR ARCHITECTURE AND THE LANDSCAPE** by Robert L. Zion
A book of photographic tree definitions, or portraits, intended to facilitate communication between the landscape architect, the architect and the layman. **$11.95**

**565 - WEEDS** by Walter C. Muenscher
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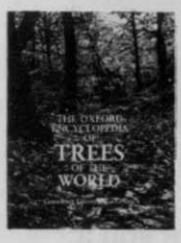


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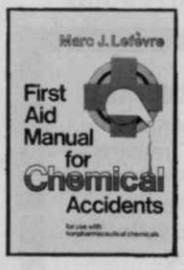


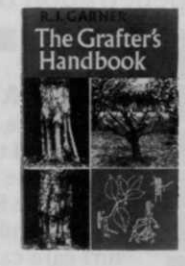


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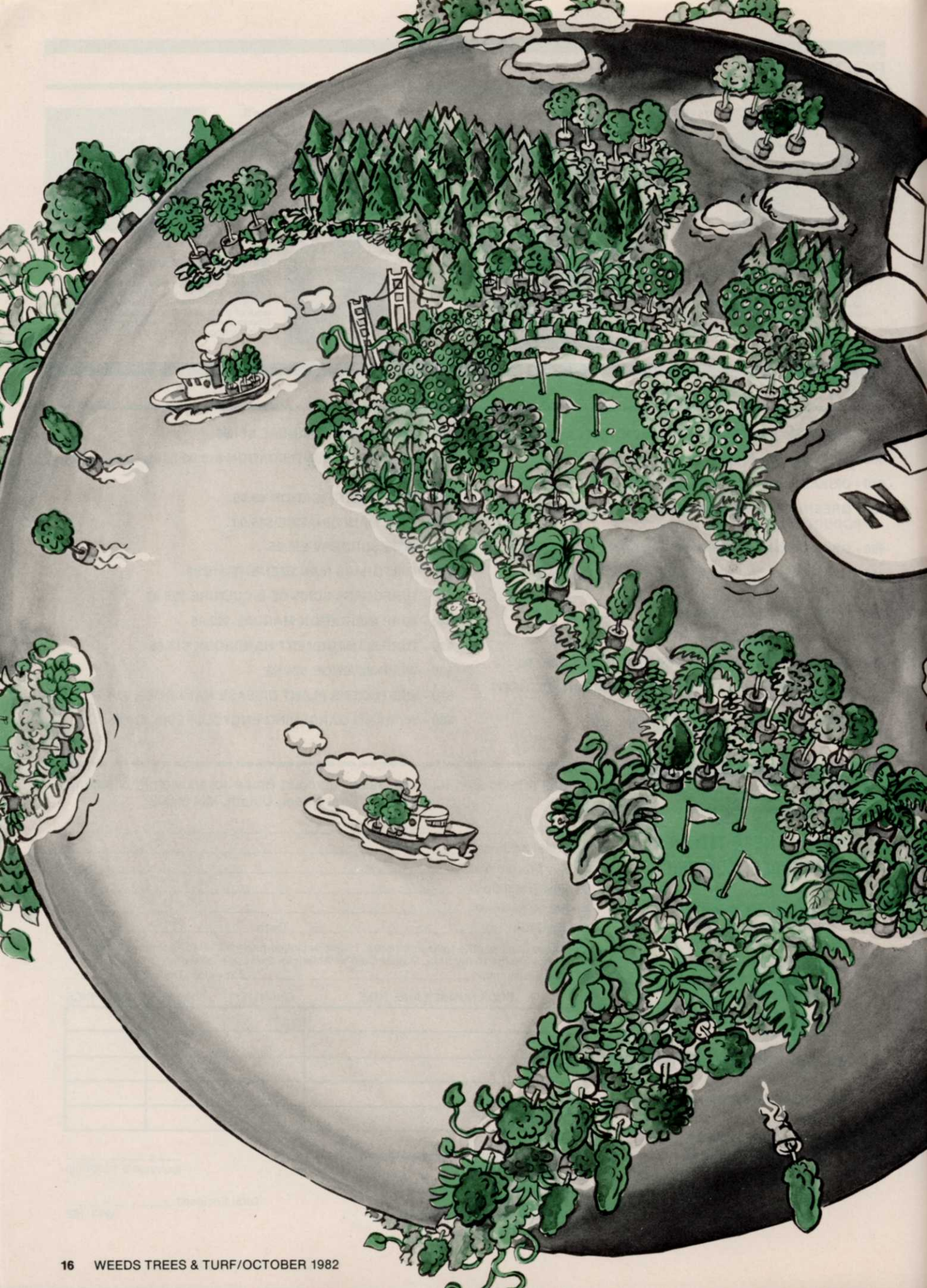

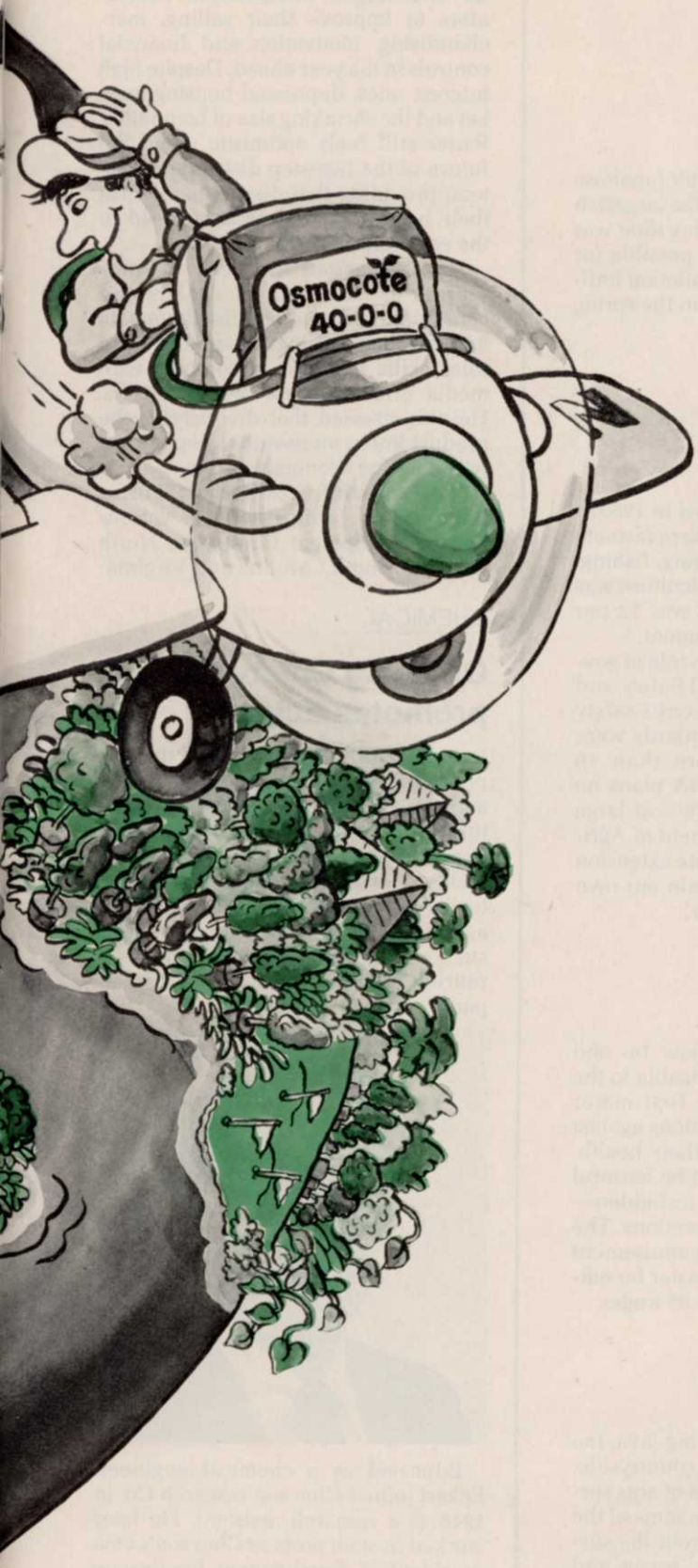


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# GOVERNMENT UPDATE

## Japanese beetle count up

The U.S. Department of Agriculture reported that the adult Japanese beetle population in the eastern United States this year was the largest in five summers. Favorable conditions last summer at egg-laying time was the cause for this resurgence. Also, a mild spring made it possible for more beetle grubs to survive to maturity. A heavy adult population indicates severe larval attacks on turfgrasses this fall and again in the spring of 1983.

## Equipment causes most agricultural injuries

The National Safety Council reported that 1900 people died in 1980 in the agriculture sector. Another 200,000 were injured. Most were farmers but the council's category includes occupations such as logging, fishing, horticulture and veterinary medicine. The death rate for agriculture was 56 per 100,000 workers while the figure for all industries was 12 per 100,000 workers. The main cause of accidents involved equipment.

There is a controversy among farm organizations about the role of government (Federal or State) in farm safety. The Occupational Safety and Health Administration (OSHA) attempt in the mid-1970's to write safety standards was shot down in the Congress. Only a few standards were developed and they were limited to farms with more than 10 employees—this exempted about 80% of U.S. farms. OSHA plans no more activity in farm safety including inspections in the 20% of large farm operations. The Extension Service of the U.S. Department of Agriculture is phasing out the program which helped pay for a state extension safety specialist. We must then study our operations and train our own employees to cut down the injuries and deaths in our industry.

## Hiring 14- and 15-year-olds

The U.S. Department of Labor proposal that would allow 14- and 15-year-olds to work more hours will probably not be applicable to the nursery and allied industries. The new provisions, the first major changes in child labor laws since 1938, still contain prohibitions against employment in occupations which might interfere with their health. Work in areas where exposure to fumes or chemicals might be harmful or the operation of power-driven machinery is expressly forbidden—this would apply to most aspects of nursery or lawn care operations. The changes are designed to help the fast food restaurants and amusement parks. The Labor Department proposal would also make it easier for employers to obtain permission to pay less than the minimum $3.35 wages.

## Insects return to Mt. St. Helens

Two years after Mt. St. Helens began smoking and ejecting lava, the insects are moving back into the ash-strewn slopes and countryside. Officials of the U.S. Forest Service believe that some species of ants survived the explosion, either deep in the ground or deep inside some of the trees. Now the winds are blowing insects and spiders in from the surrounding undestroyed forests. Earwigs, beetles, ants, bees, wasps and spiders have been detected. The beetles are beginning the destruction of the fallen trees which cannot be harvested for timber. Hopefully, the bodies of the dead insects will supply the nitrogen needed for revitalizing the barren soil.

**NEWS** *from page 10*

In his speech at the convention, Porter encouraged independent distributors to improve their selling, merchandising, motivation and financial controls in the year ahead. Despite high interest rates, depressed housing market and the shrinking size of home sites, Porter still feels optimistic about the future of the two-step distribution system, providing that distributors adjust their business practices to succeed in the economic climate.

He emphasized the need for new sources of financing for dealers and consumers and urged distributors to improve advertising, marketing and sales skills in order to compete with media oriented mass merchandisers. He also stressed that diversifying the product line is an essential step toward withstanding economic cycles.

Porter is the president of Porter Brothers Inc., a distributor of various lines of equipment throughout North Carolina, South Carolina and Virginia.

CHEMICAL

## Ortho Ag Chemical promotes Eckart

Joseph Eckart has been named the vice president of Chevron Chemical Co. and general manager of Ortho Agricultural Chemicals Division. In this position, Eckart is responsible for worldwide research, development, manufacturing and marketing of Ortho's line of agricultural pesticide products. He is succeeding Earl Stripling, who is retiring after 32 years with the company.

Educated as a chemical engineer, Eckart joined Chevron research Co. in 1946 as a research assistant. He later worked in such posts as Chevron's vice president of development for Europe and assistant to the vice president as Standard Oil of California before his most recent position as manager of manufacturing for Ortho Agricultural Chemicals.

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# VEGETATION MANAGEMENT

**By Roger Funk,** Ph.D., Davey Tree Expert Co., Kent, Ohio

**Q:** *Will milky spore disease be an effective control for a severe white grub problem in lawns? (Maryland)*
**A:** The use of milky spore disease bacteria for control of Japanese beetle grubs is one method of biological pest management. This bacterial disease is believed to be caused primarily by *Bacillus popiliae*. The commercial products such as Doom or Japidemic are registered for control of Japanese beetle larvae only. Under ideal situations the milky spore disease may provide 70% -80% grub control in a given year.

The milky spore disease powder is expensive because it presently must be recovered from infected grubs; artificial propogation methods are not available.

Apply spore powder in a grid at 4' - 10' spacing with one level teaspoon per spot (2#-10#/acre). For ease of application, spore powder also can be mixed with soil or fertilizer for broadcast treatment. Results depend upon the rate and method of application, larval population and soil temperature; more material, high grub populations and warm temperatures decrease the time required for effective control. The material has to go through the thatch and grubs must feed on bacterial spores which parasitize the grubs. The bacteria multiply and many spores are released when the infected grubs die. It may take 3 - 5 years, or perhaps longer, for the proper establishment of the disease bacterium in the soil.

**Q:** *What is the present thought on the effect of biological thatch decomposers for turfgrass use?*
**A:** Variable results have been observed by researchers working with biological decomposers. Improved decomposition has been reported in some instances where artificial inoculations were made, however, the general feeling is that cultural practices such as watering more deeply and less often and letting the surface soil dry to discourage surface roots are more effective.

**Q:** *I have heard many good comments about Oftanol 5% G insecticide for lawn pest control. Will one treatment of lawns with Oftanol for grub control also suppress surface insects such as chinch bugs, sod webworm and billbug?*
**A:** Oftanol 5% G, manufactured by Mobay Company, is an organophosphate insecticide which recently received a 24C label for turf insect use. Research reports indicate that Oftanol is effective for grub control and will provide season-long control.

If applied at the proper time, one treatment with Oftanol can control the surface insect adults which are active at that time. Once the material moves deeper into the thatch and soil, its effectiveness on surface insects is uncertain. Further research is needed to determine the extent of the effect of Oftanol for control of surface insects.

**Q;** *Several companies market gypsum as a soil conditioner for heavy clay soils. Is gypsum effective in loosening heavy clay? (Illinois)*
**A:** Gypsum or calcium sulfate will modify soil structure when applied to soils of the semiarid midwestern and western areas which contain an excess of exchangeable sodium. Gypsum improves water infiltration and aeration by replacing the sodium with calcium which encourages the aggregation of soil particles. Gypsum will not improve a soil impermeable due to compaction or fine texture.

**Q:** *Blue spruce trees which are well established (10 years) are losing needles from ground level upward. There is much white, sticky exudate on the trunks and some branches. I suspect insect injury but have found no insects. What could be the problem, and can you suggest treatment for recovery? (Indiana)*
**A:** Based on the description of the problem, it would seem that the blue spruce trees may have cytospora canker, a fungal disease which develops on stress-weakened plants and often produces white, resinous exudate. Cytospora progresses gradually from lower branches upward causing foliar discoloration and defoliation.

Research has not provided recommendations for control. We suggest that you prune and destroy affected parts. Disinfect pruning tools between cuts. Water and fertilize as needed to help improve the vigor of the trees.

**Q:** *I have a small landscaping firm and suspect that sod is sometimes injured by herbicides applied either by the grower or by the home owner after the sod is laid. What are the effects of broadleaf herbicides on bluegrass sod? (Ohio)*
**A;** Mature Kentucky bluegrass sod can be safely treated with mixtures of 2,4-D with either Dicamba or Mecoprop if applied at least four weeks before or after harvest in the spring, or four weeks before harvest in the fall.

**Note:** In the Vegetation Management column in the July 1982 issue of Weeds Trees and Turf, in answer to the question, "Are there any approved retardants for turf?" we mentioned the product "melfluidide" as being EMBARK but we inadvertently listed the wrong manufacturer. Embark* Plant Growth Regulator (PGR) is a registered product and trademark of 3M.

We are sorry for the error and appreciate the fact that it has been brought to our attention.

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**Send your questions or comments to: Vegetation Management c/o WEEDS TREES & TURF, 757 Third Avenue, New York, NY 10017. Leave at least two months for Roger Funk's response in this column.**

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# Jacobsen. Out front again with new out front mowers.

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Circle No. 222 on Reader Inquiry Card

PART I-TEES

# COMPACTION ROBS GOLF COURSE OF NATURAL TURF CONDITIONS

By RON FREAM

Soil compaction is a severe, pervasive, and insidious problem facing golf course turfgrass managers. Prevention of soil compaction should be a key factor in golf course design, construction, and renovation.

Compaction leads both directly and indirectly to many serious problems, from poor turf quality to disease and weed encroachment. It adds to maintenance costs and can lessen player satisfaction in the course.

Soil compaction is induced by compression of the soil by human or vehicle traffic. Designs which cause constricted traffic, excessive traffic, or constant traffic will eventually cause a reduction in the quality, appearance and growth characteristics of the turfgrass.

The effects of compaction become evident at widely varying rates, depending upon soil texture, soil moisture conditions, climate, original construction, and maintenance procedures.

Compaction causes a reduction in soil pore space, impedes the exchange of oxygen and carbon dioxide within the soil, and restricts water movement. In technical terms, compaction causes an increase in soil bulk density, reduces hydraulic conductivity and decreases aeration porosity. All these things decrease the vigor of desirable turfgrasses while favoring less desirable species such as *Poa annua*.

Traffic on water saturated soil caused by compaction compounds problems by encouraging more compaction, especially on fine textured soils. Signs of compaction include poor drainage, soggy or uneven surfaces, presence of *Poa annua*, increased incidence of disease and heat stress, hard surfaces, and thin turf.

There are several very direct actions which can be taken on the drawing board to assist in preventing or reducing compaction problems.

The selection of a golf course site and the location of turf features can have long term impact on future turfgrass maintenance. The arrangement of golf holes relative to one another can affect future maintenance. The location of starting tees relative to the clubhouse, the practice facilities and the parking lot must be carefully considered. The location of a greensite relative to the next tee is pertinent. How the design accomodates the natural terrain and existing vegetation can have lasting and unalterable impact upon maintenance. Equipment storage area positioning and vehicle access to and from this area can influence maintenance efficiency. There are many subtle but critical matters to be considered when the golf hole layout plan is being conceived. Over-riding concern for maintenance alone without thought of playability or aesthetics will also only result in an inferior finished product.

Site selection can have long term impact on future turf maintenance.

**Good design prevents** *beating tee area to death. (Top photo)*

**Tie walls** *provide maximum utilization of space.*

## TEEING SURFACES

Teeing surfaces receive more abuse and are given less attention than they deserve. How frequently does one arrive at the first tee only to find a rather small, rectangular, somewhat elevated area which is quite divot scarred, perhaps with more dirt than grass showing?

How simple it can be to design teeing areas which are large, functional and attractive. Larger teeing surfaces need not cause increased maintenance expense. In fact, while actual mowing time may increase somewhat; time and labor spent aerifying, top dressing and overseeding divot marks and appeasing irate golfers will likely decrease to more than offset the increased cost of mowing the enlarged surface.

When designing a new course or remodeling an existing one, teeing areas should provide no less than 5000 square feet (470 square meters) of usable surface. In fact, for shorter par 3 holes, where a divot is expected, a usable teeing surface of not less than 7500 square feet (700 square meters) would be our recommendation. Large teeing surfaces permit the turf manager to spread the traffic around with frequent repositioning of the tee markers and thereby permit the turf to recover. The golf architect

*Continued on page 28*

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should be able to design large teeing surfaces and incorporate these areas into interesting configurations and varying hole lengths. Attractive, asymetrical, multiple teeing areas can provide the necessary usable surface without the tees resembling landing strips or grass tennis courts. I do not believe there is such a thing as too large a teeing area. I know there are far too many undersized ones!

The use of soil amendments to enhance the seedbed conditions of the teeing surfaces is recommended. All too often, the tee tops are nothing more than the local soil. As soil and "top-soil" are among the world's most variable commodities, the use of soil must be carefully considered, not assumed.

Teeing areas should provide no less than 5,000 square feet.

During construction, soil amendment of the teeing surfaces can be as easily accomplished as simply rototilling a little animal manure or composted tree bark humus into the existing soils. Under conditions of a sandy natural soil, little more than this may be necessary to provide a usable teeing surface which will resist compaction and encourage deep root growth.

If, on the other hand, the local soil is a heavy lateritic clay or some other conglomeration of fine to very fine textured silt and clay materials, very extensive remedial or preventative actions may be necessary to forestall compaction and drainage problems. In general, the finer the texture or more clay-like the existing soils, the more careful and perhaps elaborate must be the procedures followed to counteract the fine textured soils' propensity to compact.

The most elaborate form of tee modification is when the tee is constructed similar to a putting green. That is, a subsurface drainage line system, gravel layer and sand/humus seedbed layer are used to totally replace or overlay the original existing but unacceptable "native" soils. Only in cases of undesirable native soils or generous budgets need this full treatment be specified. When very adverse natural soil conditions are present, even though expensive, this full replacement procedure is, in fact, a longterm investment, not an expense.

It is highly advantageous to rely on a moderate form of the full replacement solution as a standard solution to minimize teeing surface soil compaction problems. Seedbed native soils can be amended with organic humus and/or carefully selected sand, which are rototilled into the existing soil. Alternately, a mixture of select sand and humus can be placed upon the underlying native soils. Perforated drainage lines, encased with a washed, carefully sized gravel, can be used in greater or lesser amounts, as the specific site conditions dictate, to underlay the sand/humus seedbed layer. The native soil of the site, volume of annual rainfall and anticipated traffic are the principal determining factors when deciding how elaborate to build the teeing surfaces.

Green-like construction for tees is only needed in cases of undesirable native soils.

The initial shaping of the individual teeing surface areas is of the utmost importance. Teeing areas should be elevated above the adjacent terrain to provide gravity drainage. Irregularly leveled surfaces can cause water holding pockets or restrict surface drainage. Teeing surfaces should generally slope rearward to direct runoff water away from, not toward, the traffic patterns leading to the fairway and greensite. Teeing surfaces should be flat but only from side to side. Absolutely flat tee surfaces impede surface water runoff. Inclined surfaces encourage an airborne tee shot. Table top uniform surfaces do not assist in encouraging hooks or slices. Naturally, wherever upslope runoff flows onto a teeing surface, corrective or preventative action should be undertaken to divert this water away from the teeing surfaces.

The design arrangement and construction of the teeing surfaces must consider maintenance. Side slopes should be long and gradual; perhaps, 7 horizontal to 1 vertical or longer, though these side slopes need not be boringly uniform and manufactured in appearance. Slopes between adjacent teeing surfaces must also be either machine mowable or constructed with vertical walls to eliminate unusable or overly steep slopes.

Larger teeing surfaces need not increase maintenance expense.

Walls and, at times, steps can be used very successfully at some teeing surfaces for aesthetic impact and more efficient maintenance as well. Steps to provide a walk-on position onto some teeing surfaces certainly will assist in eliminating compaction and tracking up a side slope. Some very nice ornamental impact can be achieved if flowering shrubs or ground covers are used adjacent to teeing area walls where appropriate. The primary objective of using walls at all is to assist in eliminating unusable side slopes between teeing surfaces.

Do not overlook the practice range teeing area. Almost every practice tee is too small. Inadequate thought regarding the usable surface size leads to pathetic looking practice tees. Large size alone is not enough. Soil amelioration of the surface or complete replacement, if undesirable native soils, with an amendment program may be the only way to insure an ample, usable grassed surface. **WTT**

**Ronald Fream is a well published golf course architect based in Santa Rosa, California. He studied horticulture and agronomy at California State Polytechnic University and Washington State University. He has worked under Robert Muir Graves and Robert Trent Jones and performed design work in 25 countries. Ronald Fream Partnership was formed in 1979, later called Ronald Fream Design Group.**

1982 HARVEST REPORT

# SEED GROWERS SEE RECOVERY IN DISTRIBUTORS RESTOCKING

By BRUCE F. SHANK

Major gains toward economic recovery may encourage seed distributors to replenish inventories this fall says Mike Robinson, marketing director of Pickseed West in Tengent, Oregon. This restocking may turn a potential oversupply situation into one of spot shortages for many turf seed varieties except Kentucky blueglass.

"This year has been harder than usual," says Walt Pemrick of Warren's Turf Nurseries. "The East and West Coasts have held up well, but the Midwest has sufferred since it is so closely tied to industry. Seed sales overall have been down and prices of some varieties have been depressed, but things are starting to look up."

The 1982 crop of Kentucky bluegrass seed was in the bumper category. Some growers had carryover and distributors were buying conservatively. "Falling sod sales due to decreased construction and the growing acceptance of perennial ryegrasses have reduced the demand for many Kentucky bluegrasses," says Jay Glatt of Turf Seed, Hubbard, Oregon.

Robinson reported seed sales to Northeastern sod growers are strong, in fact, the growers have been more inclined to use improved, faster establishing varieties of Kentucky bluegrass. For this reason, and others, common Kentucky bluegrass faces the toughest oversupply problem.

Rains in early July cut production levels of some early maturing perennial ryegrasses by 15 to 20 percent. Tall fescues were hurt the hardest with reductions of 25 percent or more. Most tall fescues are in a building situation, from small acreage to large production acreage. Setbacks in one year slow down production increases for the coming years.

A drop in highway construction is also affecting sales, according to Larry Vetter of Northrup King Co. Vetter and Robinson reported steady sales of overseeding blends for southern winter overseeding and northern year-round overseeding. Perennial ryegrasses are replacing Kentucky bluegrasses in northern overseeding programs says Robinson.

Doyle Jacklin of Jacklin Seed Co., Post Falls, Idaho, and George Horn of O.M. Scott & Sons, Marys-

*Continued on page 30*

**TABLE 1.**

**Kentucky Bluegrass Production, 1982.**

| Variety | Production | Variety | Production |
|---|---|---|---|
| Adelphi | ample | Haga | ample |
| America | ample | Merion | excellent |
| Aquila | limited | Merit | ample |
| A-34 (Bensun) | ample | Mystic | ample |
| Banff | ample | Nassau | limited |
| Baron | excellent | Newport | excellent |
| Bayside | limited | Nugget | limited to ample |
| Birka | ample | Parade | excellent |
| Bonnieblue | ample | Park | ample |
| Bristol | ample | Ram I | excellent |
| Cheri | excellent | Rugby | excellent |
| Columbia | ample | Shasta | ample |
| Eclipse | excellent | Sydsport | ample |
| Enmundi | limited | Touchdown | ample |
| Fylking | excellent | Vantage | ample |
| Glade | excellent | Victa | ample |
| Georgetown | limited | Wabash | excellent |

**TABLE 2.**

Common Bluegrass Production, 1982.

| Variety | Production |
|---|---|
| Common | excellent |
| Geary | excellent |
| Park | excellent |
| S-21 | excellent |
| South Dakota | excellent |
| Troy | excellent |

ville, Ohio, said retail sales of turf seed were also off this year. Vetter said agricultural seed sales have seen better days too. No one is denying that this year is a tough one, but they do separate turf seed pricing from agricultural or commodity seed pricing. Good inventories do not necessarily mean lower prices.

Robinson said it best, "If the economy is turning around and distributors are starting to feel confident enough to restore their inventories, then many varieties of turf seed could be limited by next fall. Bluegrasses may take longer than one year to experience spot shortages, but one year can swing inventory levels from large to very small."

Late maturing crops such as bentgrasses, some fine fescues, and some perennial ryegrasses were helped by July rains according to Robinson. Supplies should be good for this fall.

It's safe to say that a few weeks ago some seed growers lost some sleep. Dropping interest rates indicate recovery is in sight, even though a six-month or more delay after construction recovers is expected. Seed growers may take new product development a little slower in the future and this may be more in line with product acceptance by the professional and retail seed buyer. **WTT**

**TABLE 3.**

Perennial Ryegrass, Production, 1982.

| Variety | Production | Variety | Production |
|---|---|---|---|
| Allstar | sold out | Goalie | ample |
| Barry | ample | Jackpot | excellent |
| Belle | limited | Loretta | ample |
| Birdie | ample | Manhattan I | ample |
| Blazer | ample | Manhattan II | limited |
| Caravelle | ample | NK-200 | ample |
| Citation | excellent | Omega | ample |
| Dasher | ample | Palmer | limited |
| Delray | excellent | Pennant | ample |
| Derby | ample | Pennfine | excellent |
| Diplomat | ample | Prelude | excellent |
| Eton | limited | Regal | ample |
| Elka | excellent | Yorktown I | limited |
| Fiesta | ample | Yorktown II | excellent |

**TABLE 4.**

Fescue Production, 1982.

**Chewings Fescues**

| Variety | Production |
|---|---|
| Agram | ample |
| Atlanta | excellent |
| Banner | ample |
| Barfalla | ample |
| Checker | ample |
| Highlight | ample |
| Jamestown | excellent |
| Koket | ample |
| Shadow | ample |

**Creeping Red Fescues**

| Variety | Production |
|---|---|
| Dawson | limited |
| Ensylva | ample |
| Fortress | ample |
| Ruby | excellent |

**Tall Fescue**

| Variety | Production |
|---|---|
| Clemfine | ample |

**Fall Fescues Cont.**

| Variety | Production |
|---|---|
| Falcon | limited |
| Houndog | limited |
| Galway | limited |
| Mustang | available in '83 |
| Olympic | limited |
| Rebel | ample |

**Hard Fescue**

| Variety | Production |
|---|---|
| Aurora | limited |
| Biljart | limited |
| Durar | excellent |
| Reliant | limited |
| Scaldis | ample |
| Tournament | limited |
| Waldina | ample |

**Sheep Fescues**

| Variety | Production |
|---|---|
| Covar | excellent |

**TABLE 5.**

Overseeding Blend Production, 1982.

| Brand Name | Production |
|---|---|
| CBS (Turfseed, Lakeshore) | ample |
| Dixie Green (International) | ample |
| Futura Plus (Pickseed) | ample |
| Medalist (Northrup King) | ample |
| PHD (International) | ample |
| Showboat (International) | ample |
| Winter I (Scotts) | ample |
| Winter III (Scotts) | ample |

**TABLE 6.**

Bentgrass Production, 1982.

| Variety | Production |
|---|---|
| Bardot Colonial | limited |
| Emerald | ample |
| Exeter Colonial | ample |
| Kingstown Velvet | available in '83 |
| Penncross | ample |
| Penneagle | ample |
| Seaside | ample |
| **Other Production** | |
| Fults Pucinella distans | ample |
| Reubens | excellent |



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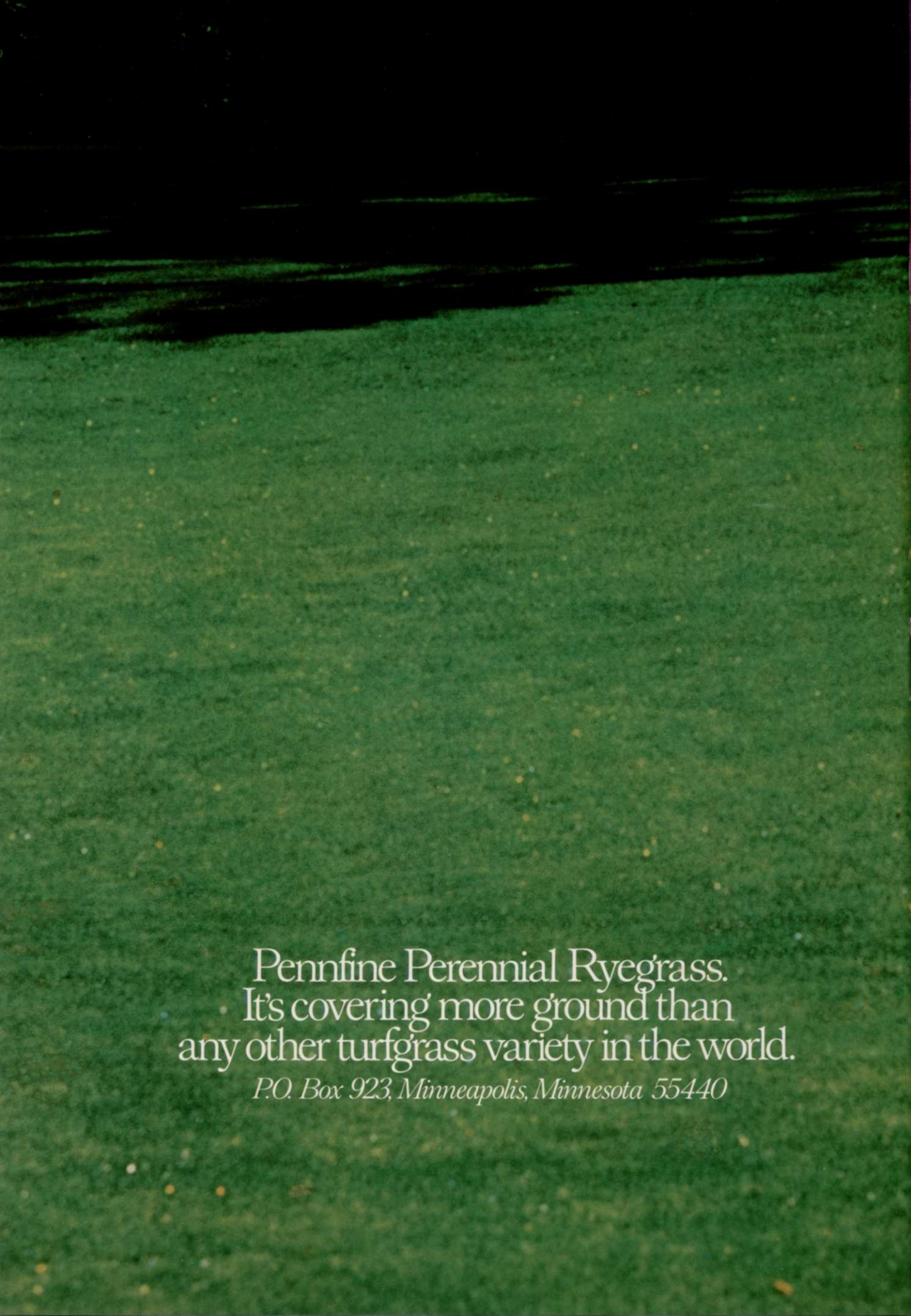
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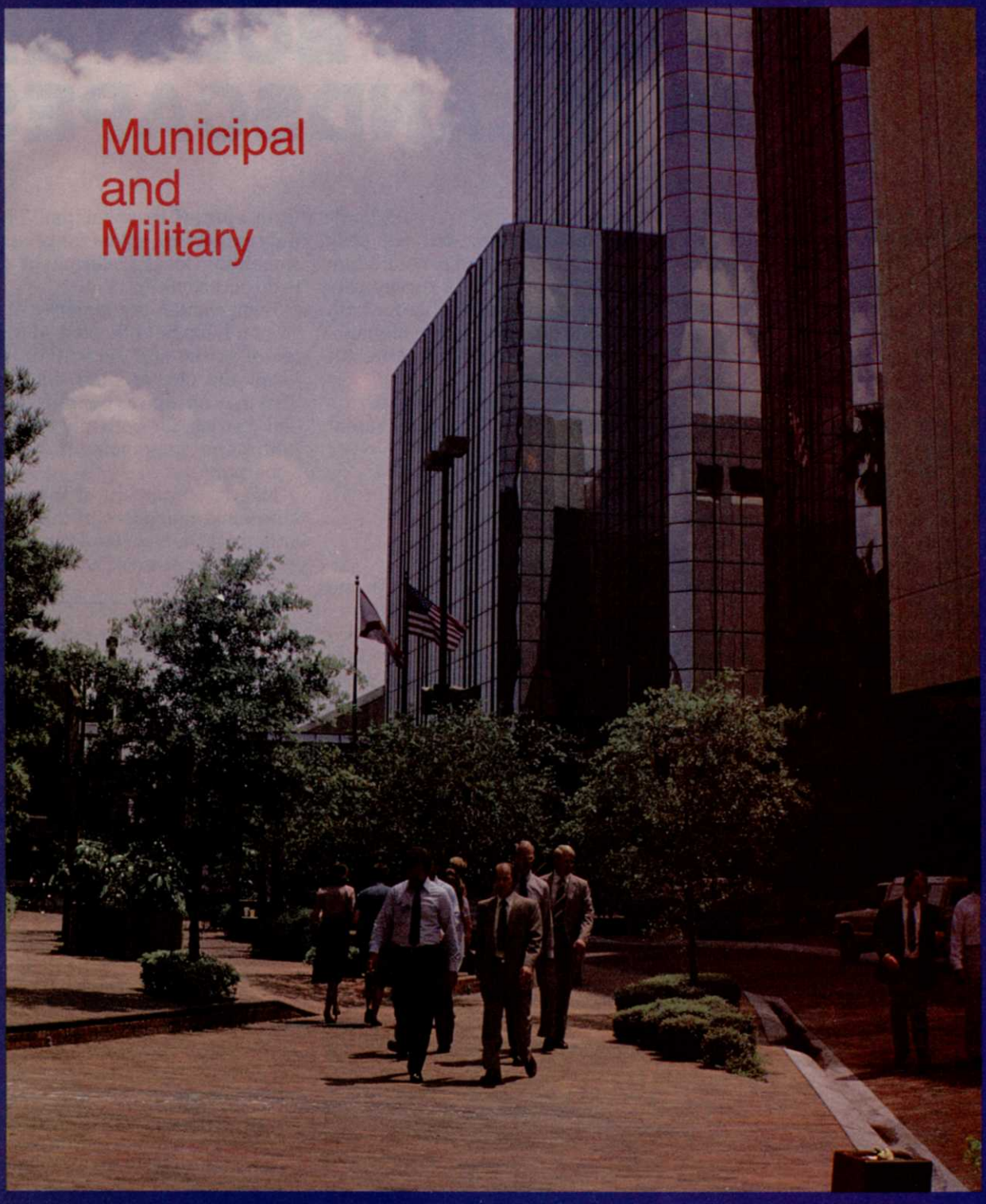
# LANDSCAPE MANAGEMENT

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Research in LANDSCAPE MANAGEMENT

# GROWTH OF SPECIAL DISTRICTS COULD BOLSTER CITY LANDSCAPES

City and park landscape maintenance often overlap according to a survey by *Weeds Trees & Turf* of its municipal landscape management circulation. Furthermore, the growth of special park districts may provide future strength to this field despite widespread budget tightening at the city level.

The U.S. Census Bureau recently announced a dramatic growth and in "special districts". In the last five years, the number of special districts has grown by 11 percent, according to the Census Bureau, but spending by special districts has increased to almost $25 billion from $9 billion.

The Census Bureau said these independent agencies, which often overlap other government districts, provide services for fire protection, sewage disposal, housing, health care, transportation, water, recreation and natural resource protection.

School districts are not part of the special agency category. The number of public school districts has decreased in the last five years. Results of the survey showed a large overlap in city and park landscape management, but not park and school or city and school. More than 75 percent of the survey participants were responsible for both park and city landscape management and held the title of Director of Parks and Recreation.

The Census Bureau reports the following count of government agencies:
Cities/Municipalities—19,083
Counties—3,041
Townships—16,748
School—15,032
Special Districts—28,733
The only figure to increase in the past five years is the special district number.

The budget security of these special districts stems from the independence of their management from elections or political pressure. The voting public sees special agencies as more efficient providers of public services since they are often funded by more than one voting area. They see special agencies as reducing the number of services required from city or county government and relate the term special to specialist. These impressions by voters make sense, something local government fails to do occasionally.

Even though the majority of the respondents held the title of director of parks and recreation, they listed the city as their employer. This may change as benefits of special districts for both city and park landscape management become apparent.

Nearly 50 percent of the public landscape managers in the survey anticipate tighter landscape budgets in the future. Less than 20 percent expected budgets to decrease. More than half also felt the public would support increased spending on landscapes if they could prove it was important.

> To obtain major new funding the landscape department head must work closely with the voters, the council, and the mayor.

The average budget, not including salaries, for city and park landscape programs was $85,956 for an average of 209 acres. That works out to be $411 per acre. Eighty-six percent responded emergency funds were available if a piece of equipment was needed during the budget year.

The budgeting process for city operated programs begins with the department head of parks and recreation or public works. He sub-

*Continued on page 42*

**TABLE 1.**
**Responsibilities of Public Landscape Supervisors.**

| Responsibility | Percentage City Considering | | Percentage Military Considering | |
|---|---|---|---|---|
| | Primary | Secondary | Primary | Secondary |
| Roadside Mntce. | 19 | 33 | 37 | 37 |
| Bldg. Landscape | 44 | 56 | 63 | 37 |
| Bldg. Interior | 33 | 23 | 37 | 25 |
| Park Mntce. | 93 | 7 | 13 | — |
| School Mntce. | 4 | 7 | — | — |
| Tree Mntce. | 41 | 30 | 25 | 13 |
| Street Mntce. | 19 | 4 | 37 | — |
| Snow Removal | 15 | 23 | 13 | 37 |
| Golf Course | 19 | 4 | 13 | 13 |
| Airport | 4 | 11 | 37 | — |
| Cemetery | 15 | — | 13 | 13 |

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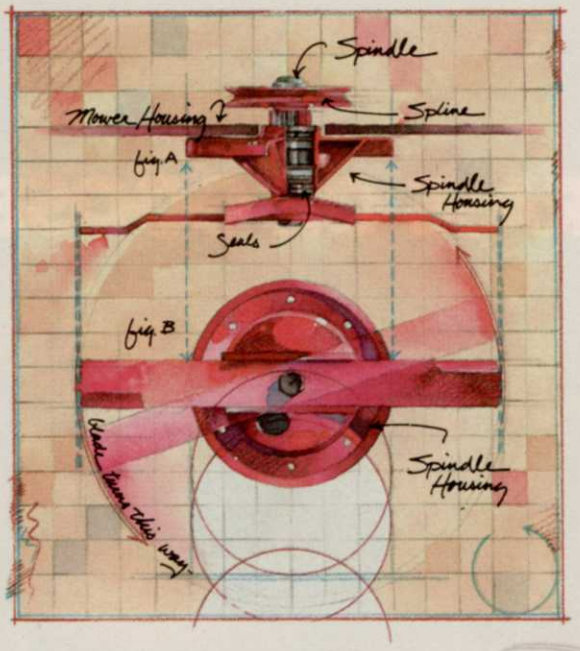


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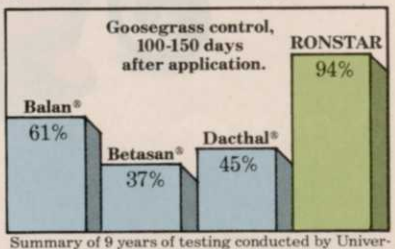


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mits his budget to the city manager, the mayor, or a commission. If it goes to a commission, then the commission sends the budget to the city manager or mayor. The auditor meets with the mayor or city manager before the landscape budget is added to the city budget. The city budget is then presented to city council for review and approval.

Sixty percent felt they could convince the public further improvement was needed.

The city council may also have a budget committee to review each department budget. Finally, the council must approve the budget.

A number of the survey respondents mentioned the importance of a close relationship with the mayor or city manager. The desires of the public are voiced through council. If a department head wants to obtain major new funding, he must work closely with the voters, the council members and the mayor.

The majority of the respondents said they did not promote landscape programs to the public, but those who did had a much better feeling about public support of future programs. Those that make the time get results.

One city director of landscape management works with local newspapers, extension agents, and local schools to generate publicity. Another involves the local Chamber of Commerce in a city beautification program. A third works with the local garden club on a yard of the month award and a yearly clean-up campaign. A fourth lets citizens "adopt a park" where citizens pitch in to help maintain park areas and plant flowers and trees.

If the public associates with the appearance of the community then financial support results, one city manager commented. The public expects results from their support, a noticeable improvement in the appearance of public landscapes. That doesn't mean expensive, high maintenance areas, but simple, attractive, and neat landscapes along the same lines a taxpayer would have on his own property. His yard then extends into the rest of the community and his interest in his city grows.

We found no consistent pattern of budget planning or buying. The only semblance of a pattern was planning is heaviest in February and March, May and June, and September and October. This spring, summer, fall planning must precede city budget planning. One respondent begins planning in February for a budget which doesn't reach the city council until May nor get approved until June.

Buying for seed, chemicals and equipment appears heaviest in February through April. A second period of equipment buying takes place in September through November, perhaps an effort to replace worn out equipment before entering a new budget period.

Nearly 75 percent of those responding specify products. One public works director uses a standards book to plan his work and select types of material. The book was prepared by a consulting engineer and covers all city functions from lawn seeding to sidewalk construction. A separate survey to military landscape managers showed a greater reliance upon standards by the military than most city landscape managers.

Public agencies have the reputation of requiring bids for nearly everything. We found that purchase orders without bids can be used if the amount of purchase is below a specified figure, ranging from $250 to $2,500 among respondents. Generally there are three limits: for purchases under $250 a purchase order signed by the department director is needed; for purchases from $250 to $1,000, two bids may be required and the auditor or city manager must sign the purchase order; for purchases over $1,000, bids will probably be required and the city council must approve. Any landscape project of decent size will require purchase orders. Equipment purchases almost certainly come under review by city council or a park board.

City and park landscape managers depend a great deal on extension agents, local university and vocational school instructors, the supplier's salesman, and magazines for making buying decisions. Less than five percent mentioned getting advise from a landscape architect or consultant.

According to the survey the primary functions of a public landscape manager are park maintenance, care of landscapes around public buildings, and management of city trees. Very few of the respondents did school landscape maintenance. Secondary responsibilities listed were roadside maintenance, snow removal, and care of street trees. Care of public building landscapes comes after park maintenance, with tree care a close third. More than 80 percent are responsible for athletic fields. Additional duties included care of utility rights-of-way, cemeteries, public golf courses, city streets, and building interiors.

Ninety percent reported most equipment maintenance was handled by city repair crews, who then work with local suppliers for parts.

Less than half of the respondents contract out landscape jobs to local landscape contractors. Those that do contract out mainly plant installation, tree trimming, and spraying.

A third of the public landscape managers felt major renovation and improvement was needed. Another third felt their landscape was passable. Another third felt they had their landscapes in good shape. But, 60 percent felt they could convince the public further improvement was needed.

More than half the respondents felt a college degree in horticulture or business is needed to perform the duties of public landscape manager.

Respondents anticipate landscape staff to stay the same. Only 15 percent expect staff size to decrease. Almost a fourth expect staff size to increase.

Overall, the future for public landscape management is comparatively good. The dominance of the park manager, pride in community appearance, recognition of horticultural expertise, and a fairly positive attitude about selling improvements to the public give the city, county, state, and park manager an edge over schools and the pri-

vate sector. A slight resistance to contracting out landscape work may be bad for the landscape contractor but good for the public landscape manager.

**Military**

The title engineer is most common to our respondents in charge of military landscapes. In most cases the landscape budget is part of the base budget controlled by the base commander, who tops a chain of command. Many areas, excluding golf courses, fall under uniform guidelines meant to provide a practical and organized environment for military training.

Most of the respondents were civilian employees of the military. Efficiency, not creativity, is the purpose of the landscape. Acreage is very large and budgets fairly small per acre. The typical respondent was responsible for 1,200 acres and had a materials and supply budget of less than $15,000.

Outside contractors were used by less than 20 percent of the military landscape managers. Plant installation and tree care were again the main uses of outside contractors.

Military managers feel, to a man, that the landscape they manage is satisfactory for its purpose, and that improvement would be hard to justify. Budget planning was most common in January, July and August. Purchasing was most common January through March with a second phase of equipment buying in August.

The primary responsibilities of military landscape managers are building and roadside maintenance. Street care and airport maintenance are also primary tasks. Secondary tasks are snow removal and utility right-of-way maintenance.

**Materials Purchased**

The government and military landscape managers in the survey had no more equipment than a mid-sized landscape contractor, with the exception of trucks and tractors. They had an average of 7.5 small push mowers and 3.5 large mowers, 3 line trimmers, 1 spray rig, 1.5 spreaders, and 3 chain saws. About half had a chipper, trencher, bucket lift truck, and turf aerifier. Fifteen percent had a soil shredder.

Government managers are big truck buyers. They averaged 3.5 dump trucks and 4.8 pickup trucks. A fourth of the respondents reported having an average of 3 truckster-type vehicles. They also had an average of 3 tractors each.

Fertilizers and turf herbicides are purchased by 90 percent or more of the public landscape managers. Two thirds use nonselective herbicides for trimming and other types of weed control. Tree insecticides are purchased by 56 percent of the group, while 40 percent purchase turf insecticides. Fungicides are also bought by 40 percent. Wetting agents and growth regulators are purchased by 17 percent of the respondents. **WTT**


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# LA RENOVATES WITH NATIVES TO SLASH WATER AND LABOR COSTS

As senior park maintenance supervisor for the Los Angeles Department of Water and Power, Sanders Barnett has done his best to halt the waste and along the way has become the model of efficient municipal landscape management. His emphasis on the use of native vegetation has significantly reduced the county's maintenance costs and created beautiful natural landscapes.

The keynote of Barnett's philosophy is simplicity. "I stress simplicity because its very hard to work with a complicated design," said Barnett. "It's more economical to work simpler; you're working with fewer elements." He approaches a landscape as a lesson in problem-solving. The simpler you solve the problem, the prettier it is going to look. Even more importantly. Barnett believes, is to solve the cause of your problems rather than camouflaging them with lush foliage. "I don't care if you spend a million dollars on a landscape, if you don't solve the basic problem it's not going to work," said Barnett.

While many municipalities have been under the gun to cut costs, few have had their fiscal problems trumpeted in the media the way California has. The city of Los Angeles is very dollar conscious and the individual departments have a vested interest in being economical. A Hollywood producer might be able to stock his garden with thirsty azaleas, rhododendrons and begonias because he has money to burn. Justifying the use of taxpayer's money is another story. The areas that are maintained by the Department of Water and Power (power plants, reservoirs, power lines) are often visible from many high-income areas. Therefore they must be both functional and appealing. In this respect, the contribution of Sanders Barnett to the Los Angeles landscape has been the use of native plants. "We have to think in terms of low water consumption plants," said Barnett, "and that brings us back to our native vegetation. Sure, we could use up a lot of water and artificially grow lush tropical gardens. But if you look at our native plants, you will see that they are just as pretty as many of the imports." Interestingly enough, the plants considered exotic in California are natives in Australia and South Africa.

> At one power plant Barnett cut water consumption to 200 gallons per week from 30,000.

The beauty and esthetics of a landscape are important to Barnett, even in planning areas that serve functional purposes (such as erosion control). Barnett told *Weeds Trees & Turf* of how plant-conscious the country has become. He pointed out how people now expect the beauty that plants add to an environment, particularly in resort areas and public places.

The Harbor Steam Plant was typical of many areas that were attractive and maintainable when resources were plentiful. The landscape was very tropical and required high maintenance. Barnett removed the tropical plants except for the palms because of their age and height. As a replacement he used a perennial mix of gazanias and three types of ground covers. Water usage was cut and the landscape is now in bloom all year round due to the variety of the plants. Barnett added a prostrate form of *ceanothus* to act as an anchor plant. The design is simple, serene and inexpensive. Barnett noted that the landscape was suffering from too much water. It used to be irrigated with $4,000 worth of sprinklers which now can be used infrequently.

At the DWP's Optimum Energy House Barnett planted a mixture of foliage that, like the Harbor Steam

*Continued on page 46*

**LA's Optimum Energy House** *not only has a native vegetation landscape, but the parking lot is partially turf blocks to reduce the impact of pavement.*

Plant, is in bloom year-round. The drought-resistant plants are so hardy that no irrigation system is required. The water needed is supplied on a "as needed" basis with a hose. Prominent in the landscape is ornamental strawberry *(fragari chiloensis)* ground cover and a wildflower mix.

While Barnett has done wonders to streamline plant maintenance at the DWP, some of his practices go uncopied by sister agencies in Los Angeles. The sound barriers along the highway system (maintained by the Department of Transportation) are still basically tropical plants that need a lot of water and maintenance. Barnett compares La's rights of way with those of northern California and finds his own city lacking. "In northern California they have been working with natives for about seven years, incorporating them into the landscape," said Barnett. "They plant them in the fall before the rains and let them get acclimated to the natural conditions under which they grow." Much of Southern California is irrigated by sprinkler systems. Barnett noted that his upstate neighbors are learning from LA's mistakes. "Why give alot of life support and maintenance to a plant that doesn't want to live there in the first place," he added. "Take the plant who originally lived there, and plant him there."

Along rights of way particular attention has been paid to the pollution resistance of the plants used.

Barnett is a strong advocate of pretesting native plants before installation.

Los Angeles has had good results with some of Australian imports. Barnett noted that generally plants with hard, waxy surfaces thrived better than those with fuzzy surfaces. The fuzzy plants trap tremendous amounts of dust and dirt and clog its stomata.

In creating a landscape, be it 20 miles of rights of way or a power station, Barnett stresses *planning* over any other consideration. He is a strong advocate of pretesting to find out what plants are suitable for that particular area. These tests include soil testing and planting of frost-susceptible plants.

"In the planning stages you can erase your mistakes with an eraser," said Barnett. "Once its planted, you need a shovel." He noted that one well-known landscape architect, Thomas Church, has been very successful with very few plants. Church has two full-time horticulturists on his staff. He plans a landscape and notes the shapes and colors of the foliage that he wants. His horticulturists then advise him which plants both meet his specs and will flourish in that area. In planning a landscape Church thinks of the ultimate color, not only what it will look like right after installation.

When working on an existing landscape Barnett always examines the plants already there. He notes which ones are thriving and what families they come from. In

*Continued on page 48*

## LA Water and Power has massive task

The use of native vegetation by the Los Angeles Department of Water and Power has an enormous impact on the landscape due to the number of areas DWP maintains. The department is responsible for 352 water and power facilities and will be adding six more. That translates into close to 11 million sq. ft. of lawn areas, 11,856 trees and over 75,000 shrubs.

According to Principal Park Supervisor Alex Costa, that is not the entire picture. DWP maintains 12 transportation rights of way (ranging from 2-12 miles each); 440,000 sq. ft. of sidewalks (that are maintained with backpack blowers and brooms due to the water shortage); 1.3 million sq. ft. of blacktop; 3.8 million sq. ft. of rock mat (areas that must be kept weed-free); and over 36 million sq. ft. of weed control areas (those with no formal landscaping) that are maintained on a semi annual or bimonthly basis. "We are one of the few entities that purposely maintains weeds," said Costa. "They hold down dust, which is a big problem for our energy equipment. The weeds are now being converted to native vegetation."

To handle the massive job of maintaining DWP's landscaping Costa has a staff of 113. Beneath Costa are two senior park supervisors, six area foremen, six area senior gardeners, one vector control specialist (who handles chemical operations), six pest control operators (licensed by the state), one propagation supervisor, and gardeners. The department is responsible for most of its own design work and that is generated in-house.

The department's budgeting is handled by a two-tiered system. Manpower, equipment, equipment maintenance and materials are budgeted and funded through municipal channels. A second level of budgeting is required for "on-demand work." Special projects not in the annual budget are funded separately. To purchase equipment, Costa and his staff work up a list of specifications and submit them to the city's purchasing agent who does the actual buying. Maintenance of equipment is handled by DWP's Shop Service, who has a staff of 15 doing small equipment repair.

For the first time Costa's office is contemplating contracting work out. "The city wants us to reduce our staff, so we're studying the cost-effectiveness of doing the work ourselves or contracting it out," said Costa.

**WTT**

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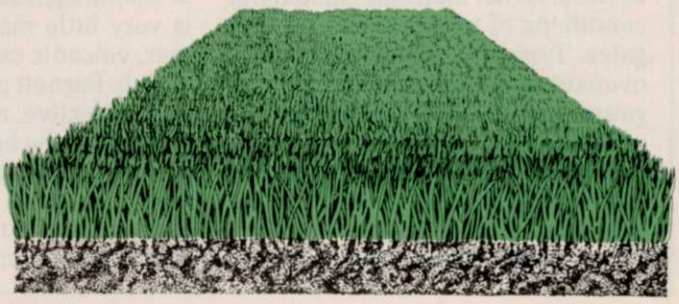
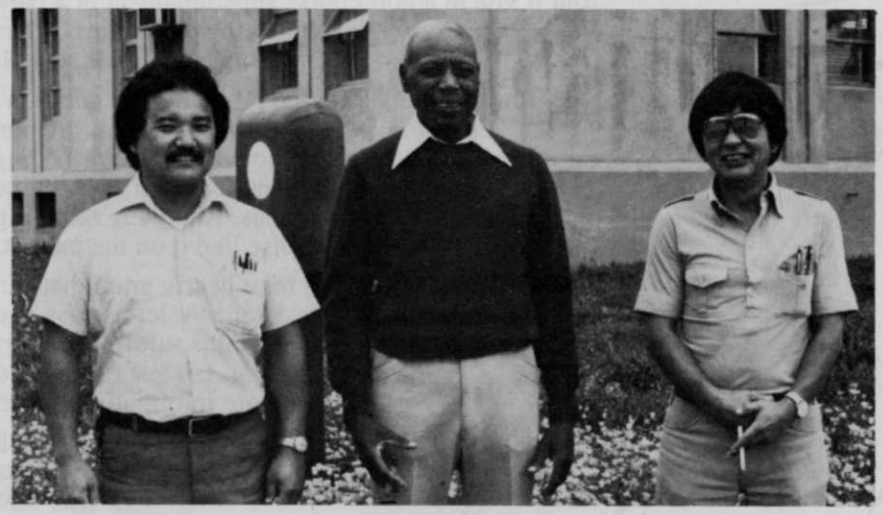


Circle No. 114 on Reader Inquiry Card

**LA RENOVATES** *from page 46*



**Barnett** *(center) with two crew chiefs prior to his retirement.*

his contact with landscapers, Barnett advises them to steer their clients away from plants that have marginal chance of survival or short blooming seasons. He finds many instances where people in mountainous regions want to plant azaleas. They look good in the summer but die after the first frost. Although many Southern California residents can afford to foot the bill of replacing the plants, to Barnett that is not the point. "If something is planted where it won't flourish, it is a waste of plant life, water and money," said Barnett. "Everybody suffers, because plants and natural resources are being wasted."

Another facet of proper planning is to know the proper moisture requirement of your plants. "We kill more plants with the water hose than anything else," asserted Barnett, "in both tropical and arid environments." He noted that a lot of the Australian and New Zealand imports currently being used suffer from "overculture"—too much water. One of the reasons for the overuse of water, according to Barnett, is that man can't match the conditions of nature when he irrigates. Typically when it rains it is overcast and humid, while an irrigation system waters according to a schedule (during which it is often sunny and dry). The natural condition lends itself to a much more efficient use of water.

In many cities, such as Los Angeles, water allocation is not a matter of money but of priorities. Those who waste it will not be able to get it when the water shortage hits (and in many areas it will) regardless of their income. Many of Dpw's power stations are being relandscaped with native plants to cut water use. Just as the Optimum Energy House is a prime example of native vegetation for the consumer, many government landscape managers could pick up some hints from Barnett's treatment of the Sylmar Converter power plant. The ground cover is similar to the Optimum Energy House's, largely ornamental strawberry with red berries and white blossoms. To minimize the weeds, Barnett laid down a four mil thick black polyethylene tarpaulin to cover the soil. He then went over it with an aerifier and punched holes to allow water to seep in. "The tarp cuts sunlight but retains water," said Barnett. "We cut our weeds by 95% and instead of using up to 30,000 gallons of water per week, we use as little as 200 gallons." He added that once the ground cover is established (6-12 months), there is very little maintenance. At Sylmar, volcanic cinders are used as a mulch. Barnett pointed out they are very effective retaining water regardless of the heat.

Beautifying a power station, with conservation in mind, is no small feat. Yet Barnett has gone even one step further and illustrated how functional foliage can be. The generators at the plant have to be kept very clean to work efficiently. Trees were planted in front of the fences bordering the generators and serve the dual purpose of obscuring the ugly generators from view and also trapping dust to cut down on generator maintenance. Due to the generators' need for air only 60% of the fence could be covered. The irrigation for the station is a drip system. Two systems have been set up—one for the ground cover and one for the trees and shrubs. Barnett's reasoning is that they have different requirements, so it would be a waste to water the whole station when only the shrubs needed water.

One innovation that has commercial potential for many landscapers is the carport at the Optimum Energy House. The parking lot at OEH is very unparking lot-looking because it is grass and not paved concrete or asphalt. Concrete units that consist of blocks set two inches apart are set on a sand base. One and one-half inch of top soil is added and then grass is planted. The effect is a green and white checkerboard parking lot. The cars literally mow the grass, but because the plant is set below the surface the plant survives. Barnett noted it is also tremendously cooler than asphalt, not a small benefit in Southern California.

A point often brought against the use of native vegetation is its uncontrollability. It doesn't necessarily bloom right on secheule. Barnett believes this is something we will all have to adjust to in the future because will simply won't have the resources to maintain tropical vegetation. Annuals and mediterranean imports will also fall by the wayside as the water flow is turned down to a trickle. Barnett told *WTT* that we should be opting for year-round foliage color, not bloom color. "I know that if some of my plants don't come up one year, they will the next and eventually the landscape will be just as I planned it, said Barnett. As resources tighten, that's a philosophy many people will be embracing. **WTT**

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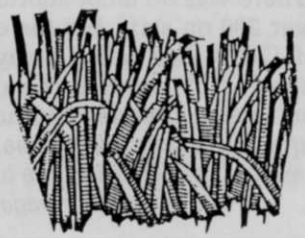
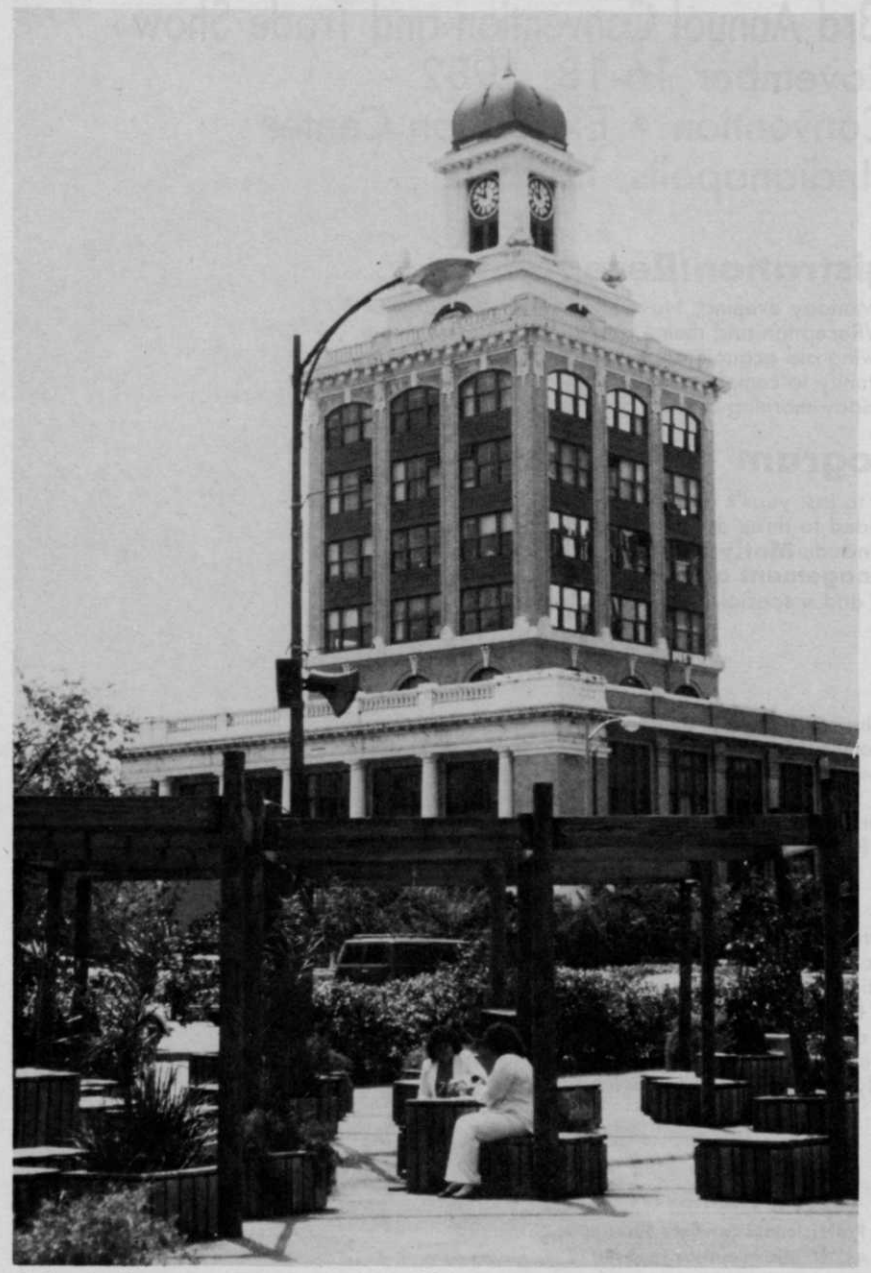


Profiles in LANDSCAPE MANAGEMENT

# TAMPA TRIES COMPUTER TO INCREASE EFFICIENCY BY SETTING PRIORITIES



**Arbor in** *downtown Tampa invites public use of parks.*

Computers are a fact of life now and learning to use them is fast becoming a necessity for people in all occupations. The Municipal Parks Department of Tampa, FL is following the trend. But the efficiency and information control to be gained from putting a Parks Department on-line is not without problems as Parks superintendent Ross Ferlita explained.

A year ago, the Tampa Parks operation was out of control. Its responsibilities had increased many times in a short period, as lands that had been maintained by other city departments were turned over to Parks. In a financially stable city government, Ferlita had no trouble picking up the extra crews to maintain the new property, but he was without the management structure to run such a large staff over the 1400 acres cared for by the city.

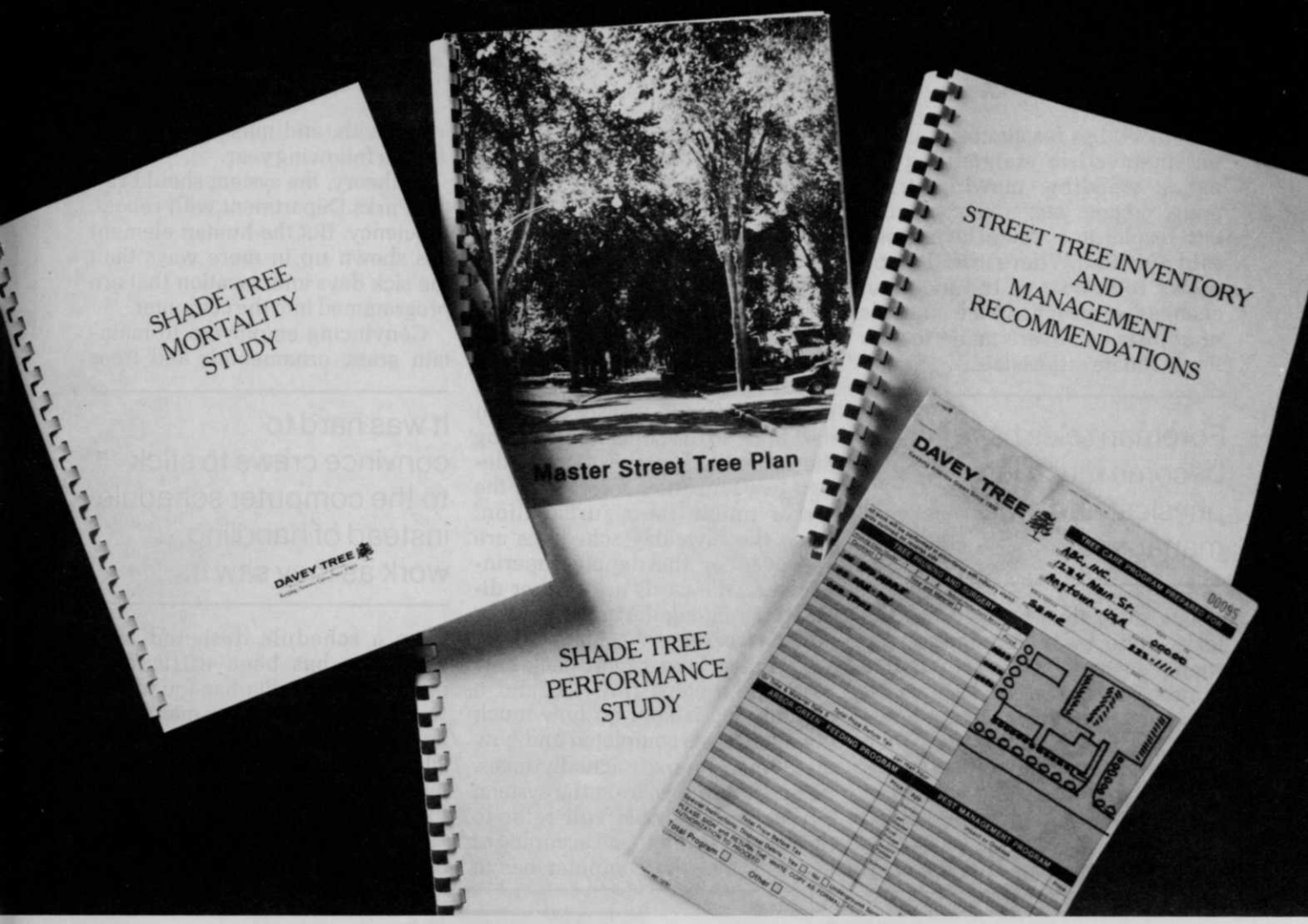
As a result, crews with minimal supervision were operating from an inconsistent system of work orders. Priorities for jobs were often being set on a day to day basis by the crews themselves. The end product was a haphazard maintenance job. Vacant areas needing minimal maintenance were receiving more man hours than necessary while highly visible, intensely landscaped parks were inadequately kept up.

Ferlita and the city recognized the problem and brought in a management consulting firm who organized the present system. The firm first had to assess the maintenance needs of the parks and the works capabilities of the crews. Data would then be correlated in the creation of a program to provide the most efficient use of the department's resources.

> Each crew was setting its own priorities with haphazard results until the computer began scheduling based upon system-wide needs.

The first task in the project was to determine exactly how much could be accomplished by the manpower available to the department. There was no labor shortage with over 200 on staff. But the demise of CETA had taken away a large surplus of workers the department was accustomed to having, requiring more careful use of those remaining. "We did time and

*Continued on page 52*

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**TAMPA** *from page 50*

motion studies for all of the activities involved in maintaining the parks: weeding, mowing, trimming, edging, etc. and compared our results to national averages," said Ferlita. Where the Tampa crews fell short of the average, changes were made in the methods or adjustments were made for the local climate differences.

Foreman roles have become much less physical and more managerial.

The study then broke down the tasks done by maintenance personnel in to 46 work activities to standardize the methods for each activity. The number of man hours required for each task was then computed. The standard methods were incorporated into a book of performance guidelines and given to the staff.

Each task was fed into the computer with the amount of time and supplies it would take following the uniform method. The computer's job was to allot each job to one of the four district crews, the citywide crew or the forestry crew.

Each month, the computer produces a stack of cards. On each card is one of the jobs slated to be done that month. The cards are sorted by district, delivered to the manager of each district and then delegated to the supervisors. Using the cards the supervisors must design two schedules for each of the crews under their jurisdiction. Once the biweekly schedules are approved by the deputy superintendents, the cards are further divided up among the crew foremen and the workers.

The men later report back how many jobs were finished and a monthly log is kept on how much the schedule is completed and how many man hours it actually takes. At the end of a year on the system, Ferlita and his staff will refer to these logs to update the accuracy of the data that the computer has to work with, and make adjustments for the following year.

In theory, the system should run the Parks Department with robotic efficiency. But the human element has shown up in more ways than the sick days and vacation that are programmed into the computer.

Convincing employees to maintain grass, ornamentals and trees from a schedule designed by a computer has been difficult in many cases. Ferlita has found that workers and foremen, many who have been in the department for 20-30 years, always devised their own schedules according to what they observed on a day to day basis, "It was hard to convince the foremen to stick to the new schedule, if

It was hard to convince crews to stick to the computer schedule instead of handling work as they saw it.


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they saw grass that needed to be cut, they cut it, regardless of whether it was a level three area and not to be cut for three months," said Ferlita. These activities seem conscientious, but they divert time away from completing items on the list.

Ferlita also found resistance to the increased paperwork for supervisors and foremen. Their roles have become much less physical and far more managerial. "We have been able to keep most of the people in the same jobs, but we have had to take people that have been with us for years and channel their thinking into a whole new pattern of planning ahead to write schedules, record what gets done, and keep a backlog of additional work to be done in extra time," explained Ferlita.

The Department has overcome many of its personnel problems by training the foremen and supervisors in the design and use of the system to clarify how their activities fit into the whole. Ferlita and his deputies have found patience in this endeavor has paid off. Most employees needed more than one sitting through the training class on the system to fully understand it. As Ferlita explains, "it often hits like a bolt of lightning; after attending the same class two, sometimes three times, the picture finally comes together for them."

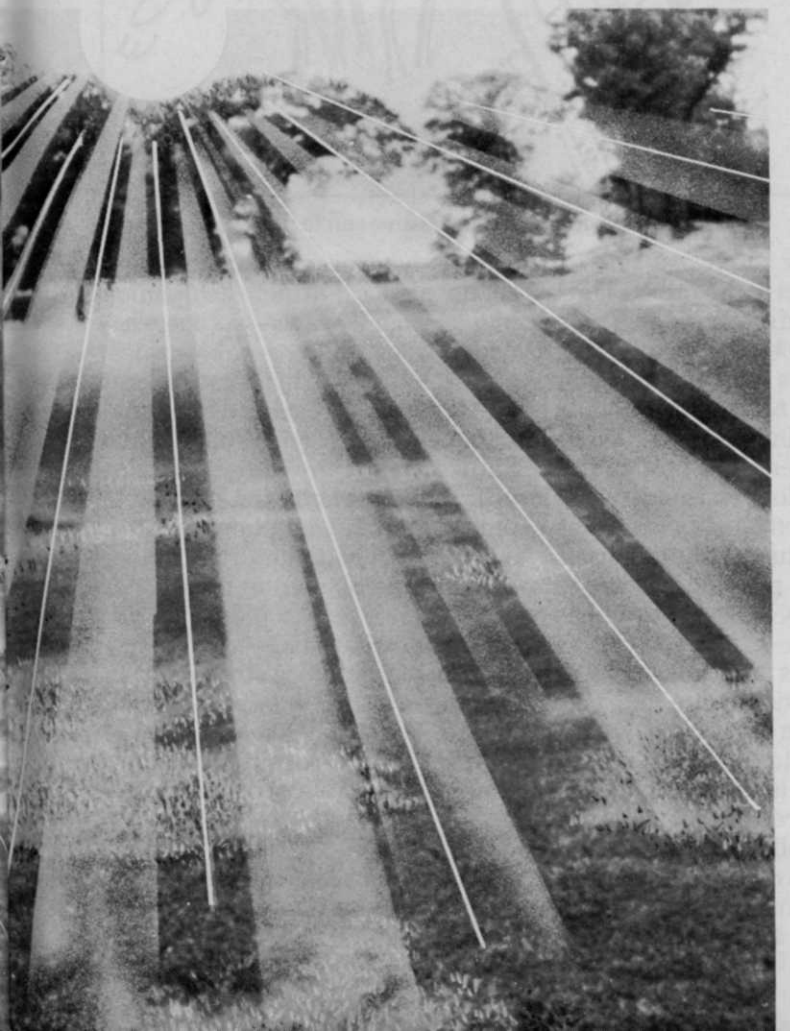
As the personnel problems in the field are ironed out, the system had has been showing some immediate benefits to the operation of the administrative offices. Requisitioning and inventory are now done through the computer. Records for materials and supplies use are kept, not only in terms of the quantities used, but also according to the jobs and crews by which they were used. The computer then automatically purchases general supplies according to the inventory levels.

Budgeting, which begins in May, is a much simplified process with the computer. As plans are made for the coming year the data from the preceding year can easily be called up to document requests that may be questioned.

The Parks Department submits their finished budget to the mayor's office in mid July. "Now when we go to defend our budget, we're not arguing with estimations, its all there in black and white," said Ferlita. Although the final procedure is to submit the budget to the City Council in mid-August, in Tampa's strong mayoral government, the Council has very little power to revise and almost no option to veto the document that the mayor's office presents to them.

An evaluation of the management system will be made at the end of a full year. Ferlita is already aware of small changes that may have to be made but wants the system to run a complete year to get a consistent picture. At year's end, the monthly and quarterly reports of work finished will be pulled out and seriously compared to the original projections.

**WTT**

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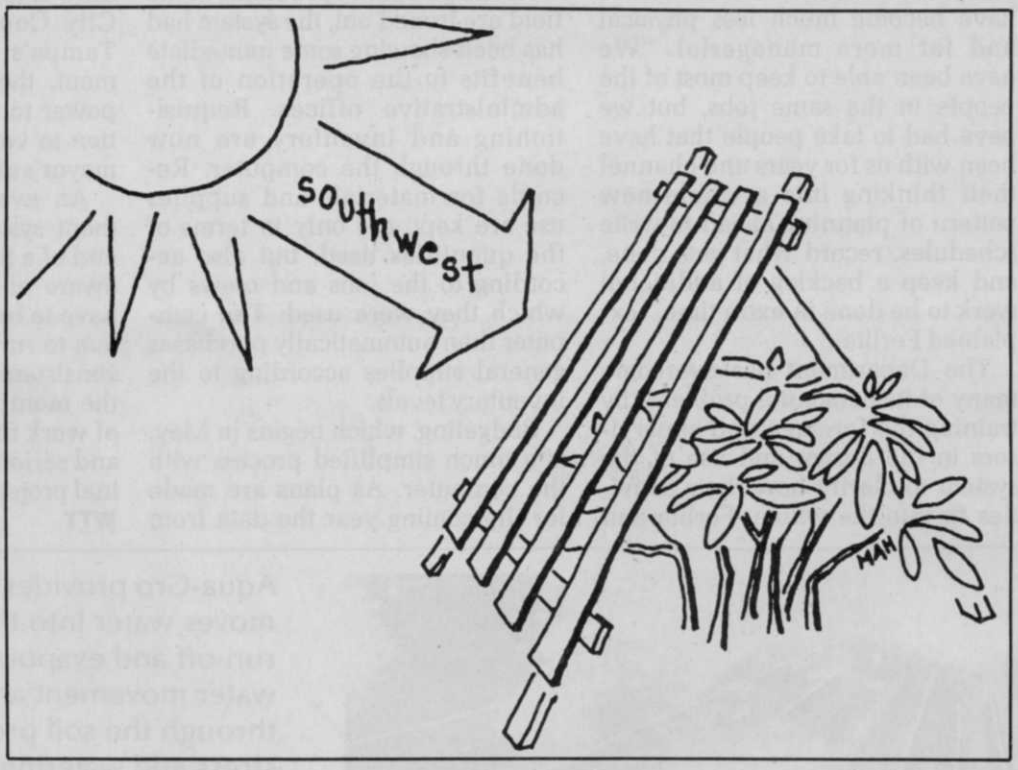
# COMBAT WINTER'S FURY WITH SIMPLE PRECAUTIONS

BY DOUGLAS CHAPMAN




**Protect evergreen** from excessive sun in mid to late winter.

Winter protection is a consideration of every horticulturist. When considering winter protection, we are trying to protect against desiccation (sun or wind induced), temperature fluctuation, salt, and rodent injury. We must all consider slight modifications or, if you will, precautions to the rigors of winter.

Desiccation or loss of water is most severe on evergreens but can also be a problem on newly transplanted deciduous trees, notwithstanding, any plant exposed to bright winter sun or severe southwest winds. This extreme loss of water or death due to loss of water is often called sun scald or southwest injury. Essentially, one should try to protect evergreens from excessive sun mid to late winter (February-March). This protection can be nothing more than a bushel basket or snow fence on the south or southwest sides of plants or correct companion plants, e.g. rhododendrons under pines. The key to protecting against this type of injury is to slow the drying late winter or early spring winds. Further, it is important to insure there is sufficient moisture so that when the soil does warm up, water is quickly replenished to the plant. Although structures are often used, branches from pruning, discarded Christmas trees, burlap, etc. will do an effective job.

Sun scald is another form of death of plant tissue due to drying sun. Often, as in wind burn, we see it on the south to southwest side of the plant. This is essentially desiccation of evergreens, that is the sun warming the foliage, thus allowing transpiration to occur while having a root system frozen and, thus, not active. Similar structures as mentioned above are used to protect or shade plants. Further, companion plants, such as yews—spruce, rhododendrons—pine, oak—azalea, are effective. Lastly, many plants are tolerant or resistant to wind burn, e.g. Norway Spruce, White Spruce, and many of the junipers. In fact, these plants can be used to protect more tender plant material, e.g. yews, rhododendrons, *Acer palmatum*. Companion planting or protection of tender plants is critical to winter survival.

Wide temperature fluctuation in a short period of time is considered more damaging than high or low temperature extremes. Many plants are capable of withstanding

**Douglas J. Chapman is a Horticulturist at Dow Gardens, Midland, Michigan**

temperatures of 20 to 30 degrees below zero, e.g. *Rhododendron catawbiense, R. maximum, Acer griseum, Koelreutaria paniculata,* but a few will tolerate 30 to 50 degree temperature fluctuation in one day. Several ways to protect against rapid fluctuation include protection of tender plants (giving a north to northeast exposure) and mulching.

Desiccation is most severe on evergreens, but can also damage newly transplanted deciduous trees.

Mulching for winter protection is under utilized. Many of us in the landscape perceive mulches as an opportunity to conserve moisture and reduce competition due to weeds, but these same mulches are particularly effective insulators and, therefore, reduce temperature fluctuation. Several of the best mulches are organic, e.g. wood chips, bark, peat moss, compost. These materials not only reduce maintenance but help the soil stay colder longer, if you will, warm up slower in the spring. Further, they conserve moisture by reducing competition and evaporation—again, an opportunity to integrate year-round maintenance with a unique consideration—"winter protection." If organic mulches are used, they also help improve the tilth of the soil and encourage plant survival.

Application of sodium chloride, or salt, can be one of the most single devastating practices to the landscape. Many native plants are intolerant of chlorides. Dirr in Illinois did some classic research showing that chloride was, in fact, the harmful element and that some plants are considered more sensitive. One of the outstanding lists revealing sensitive and insensitive plants to chloride was written by Harold Davidson of Michigan State University. His literature review showed clearly that some plants are intolerant to chloride applied to the soil and/or foliage.

**TABLE 1**

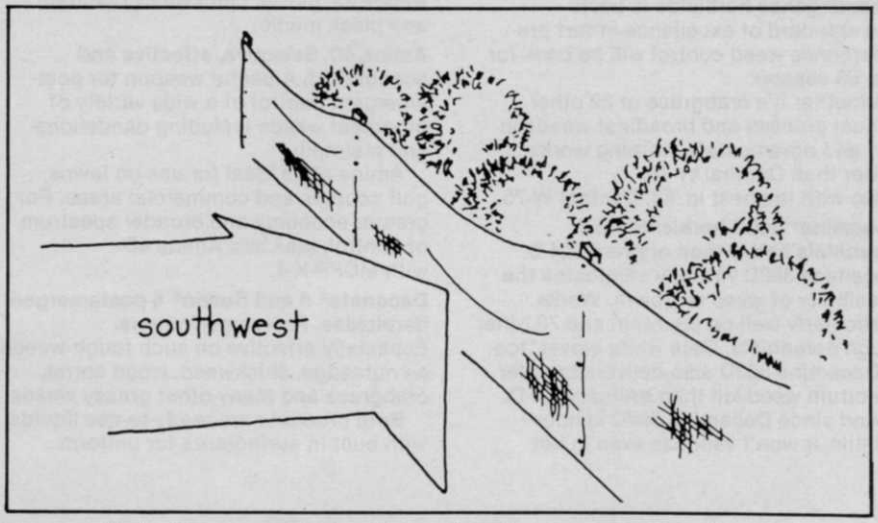
| CHLORIDE TOLERANT | CHLORIDE INTOLERANT, SOILS | CHLORIDE INTOLERANT TO FOLIAGE |
|---|---|---|
| *Acer campestre* | *Crataegus sp.* | *Acer ginnala* |
| *A. platanoides* | *Gleditsia triacanthos inermis* | *A. palmatum* |
| *A. rubrum (spray)* | *Picea pungens* | *Amelanchier sp.* |
| *A. saccharum* | | |
| *Aesculus hippocastanum* | | |
| *Alnus glutinosa* | | |
| *Betula papyrifera* | | |
| *Juniperus virginiana* | | |
| *Malus sp.* | | |
| *Pinus nigra* | | |
| *Quercus macrocarpa* | | |

One must build structures around intolerant plants, e.g. burlap, to protect against chloride drift on foliage or branches.

Rodents, specifically mice and rabbits, can raise havoc in the garden. Rodents guards, such as wire mesh or plastic collars that surround the tree trunk, remain the best protection. Rodent guards should be put on prior to the end of November or the initial freezing. One-quarter inch wire mesh or hardware cloth should surround the trunk at the base up to 18 inches if possible. One often sees different rodenticides or poison baits being offered as a major control mechanism, but for public landscapes, e.g. corporation grounds, arboreta, or parks, the increased liability or chance of someone being hurt, precludes the use of these materials. If one is looking for biological control possibilities, having one in-house cat per 10 to 15 acres might be ideal. If this is impractical, rodent guards fill the needs.

Deer can be devastating to the landscape. They not only chew on plants in the *rosaceae* family, e.g. crab apple, cotoneaster, but *Euonymus vegetus* and yews are particularly attractive, in fact, seem to be preferred food. There are several repellants that can be used in an effort to reduce deer damage. They include bone tar oil, Thiram, and a new trade-marked product, called Hinder. It must be stressed, though, that these are only repellants and, if the deer are under stress, they will still eat through repellants. Further, if you are in a heavily populated deer area, the growing of tulips can be extremely difficult and one may want to consider substituting daffodils, as they are a non-preferred food.

Winter protection is important and can be accomplished through companion plantings, correct exposure, or mulching. Further, rodents and other animals can have a negative impact in the landscape.

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**Dacamine® 360D herbicide. Kills perennials better than ordinary 2,4-D.**
Dacamine 360D virtually eliminates the possibility of weed regrowth. Works particularly well on plaintain and 70 other tough perennials. Gets white clover* too.

Dacamine 360D also delivers broader spectrum weed kill than ordinary 2,4-D.

And since Dacamine 360D is non-volatile, it won't vaporize even in hot weather. So there's no risk of injury to nearby ornamentals from vapors.

**2 Plus 2 (MCPP + 2,4-D Amine). Tough on weeds, easy on the pocketbook.**
Designed in a convenient package mix, 2 Plus 2 delivers economical control of pesky common broadleaf weeds on turf and fairways.

For broad spectrum control that's tender on grass and non-harmful to tree roots, use 2 Plus 2.

**MCPP-K-4. Early control of tough viney weeds.** Specially formulated for use on lawns and golf courses to give early, first-rate control of such hard-to-control weeds as: clover, chickweed, plaintain and black medic.

**Amine 4D. Selective, effective and economical.** A useful weapon for post-emergent control of a wide variety of broadleaf weeds including dandelions and plaintain.

Amine 4D is ideal for use on lawns, golf courses and commercial areas. For greater economy and broader spectrum of control, tank mix Amine 4D with MCPP-K-4.

**Daconate® 6 and Bueno® 6 postemergent herbicides. Proven performers.**
Especially effective on such tough weeds as nutsedge, chickweed, wood sorrel, crabgrass and many other grassy weeds.

Both products are ready-to-use liquids with built-in surfactants for uniform wetting. (Bueno 6 sold only in western states for use on turf.)

**Turf Care. Better order now for better turf.**
Your hard work and expertise and our fine line of Turf Care products are the perfect combination for healthier, more beautiful turf.

See your Diamond Shamrock distributor today.

*As permitted by FIFRA Section 2(ee).

**Diamond Shamrock**

**Agricultural Chemicals**
Diamond Shamrock Corporation
1100 Superior Avenue
Cleveland, Ohio 44114

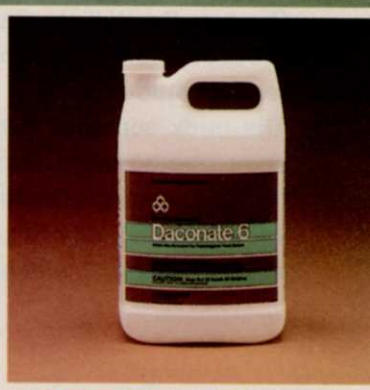
Always follow label directions carefully when using turf chemicals.

Circle No. 106 on Reader Inquiry Card

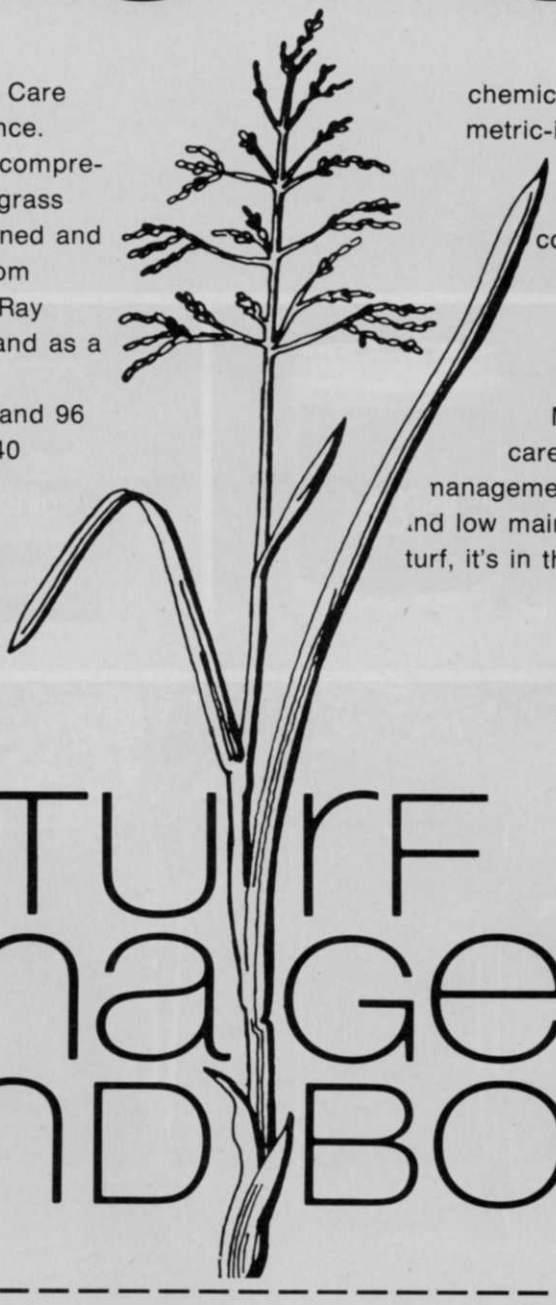
2 Plus 2

MCPP-K-4
Turf Care

Amine 4D


Daconate 6

# Finally, An Aid For Teaching Turfgrass



Superintendents, Contractors, Lawn Care Managers, New, On-the-Job Reference. The Turf Managers' Handbook is a comprehensive, organized approach to turfgrass science and care. It has been designed and written by leading turf specialists from Purdue, Dr. William Daniel and Dr. Ray Freeborg, for on-the-job reference and as a text for students.

The book contains 150 illustrations and 96 color photographs. Data includes 240 tables and forms. Included are specifications for rootzones, employment, calculations for chemical applications, and extensive metric-imperial conversion. Business and technical aspects of turfgrass management are covered in this 424-page book. Planning, purchasing, hiring, construction, and plant selection are put together for easy on-the-job reference. Markets covered include lawn care, sod production, golf course management, cemeteries, athletic fields, and low maintenance areas. If it concerns turf, it's in the Turf Managers' Handbook.

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# EVENTS

**The current issue of WEEDS TREES & TURF carries meeting dates beginning with the following month. To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 757 Third Ave., New York, NY 10017.**

**Kentucky Turfgrass Council** Conference and Field Day, **Oct. 12-14.** Contact Dr. Powell, Dept. of Agronomy, University of Kentucky, Lexington, KY 40506. (606) 258-5606.

**Central Plains Turfgrass Foundation** and Kansas State University Turfgrass Conference. Glenwood Manor, Overland Park, KS. **Oct. 18-21.** Contact Larry Leuthold, Extension Horticulturist, Kansas State University, Manhattan, KS 66506. (913) 532-6173.

**Turfgrass Fertilization Symposium,** Columbus, OH, **Oct. 20-21.** Contact Dr. B.G. Joyner, Plant Diagnostic Lab, Chemlawn, 6969 Worthington-Galena Rd. Suite L Worthington, OH 43085, 614/885-9588.

**Southwest Turfgrass Association** Annual Meeting, El Paso, TX. **Oct. 21-22.** Contact Arden A. Baltensperger, Agronomy Dept., Box 3Q, New Mexico State University, Las Cruces, NM 88003. (505) 646-3138.

**Nebraska Arborists School,** Omaha, NE, **Oct. 25-29** Contact Dave Mooter, Nebraska Forest Service, 8015 West Center Rd. Omaha, NE 68124, 402/444-7804.

**Atlantic Seedsmen Association Annual Convention,** Fort Magruder Inn, Williamsburg, VA, **Nov. 3-5.** Contact Margaret Herbst, 230 Park Avenue, New York, NY 10017, 212/685-5917.

**Columbia Lawn and Turf Conference,** Missouri Valley Turfgrass Association and University of Missouri, Ramada Inn, Columbia, MO. **Nov. 3-5.** Contact Nik Palo, 344 Hearnes Bldg., University of Missouri, Columbia, MO 65211. (314) 882-4087.

**National Landscape Maintenance Conference,** Dallas, TX. **Nov. 7-9.** Contact Associated Landscape Contractors of America, 1750 Old Meadow Rd., McLean, VA 22102. (703) 821-8611.

**New York State Turfgrass Association** Conference and Trade Show, Rochester, NY. **Nov. 9-11.** Contact NYSTA, 210 Cartwright Blvd., Massapequa Park, NY 11762. (516) 541-6902.

**California Landscape Contractors Association Annual Convention,** Hawaii, **Nov. 10-14.** Contact CLCA, 916/448-CLCA

**Professional Grounds Management Society** Conference and Trade Show, Vacation Village, San Diego, CA. **Nov. 14-18.** Contact PGMS, 7 Church Lane, Pikesville, MD 21208. (301) 653-2742.

**Metropolitan Shade Tree** Conference, Arlington Knights of Columbus Hall, Arlington, VA. **Nov. 18.** Contact Bruce Whiton, Virginia Cooperative Extension Service, 901 Wythe St., Alexandria, VA 22314. (703) 838-4333.

**New Jersey Turfgrass Expo,** Atlantic City, NJ. **Dec. 6-9.** Contact Dr. Henry Indyk, Soils and Crops Dept., Cook College, Rutgers University, PO Box 231, New Brunswick, NJ 08903. (201) 932-9453.

**Ohio Turfgrass Conference,** Ohio Center, Columbus, Oh. **Dec. 7-9.** Contact Dr. John Street, OTF, 2021 Coffey Rd., Columbus, OH 43210. (614) 422-2601.

**Oklahoma Turfgrass Research Foundation** Annual Meeting. Hilton Inn, Oklahoma City. **Dec. 8-10.** Contact Dr. R.V. Sturgeon, Exec. Secretary, 115 Life Science Bldg.-East, Oklahoma City, OK 74078. (405) 624-5643.

**ALCA Annual Convention,** Miami, Fl. **Jan. 15-21.** Contact Associated Landscape Contractors of America, 1750 Old Meadow Rd., McLean, VA 22102. (703) 821-8611.

**Update on Tree Care** for the Professional, University of New Hampshire, Durham. **Jan. 18-19.** Contact J. Karen Kauler, University of New Hampshire, Div. Continuing Education, Brook House, Durham, NH 03824. (603) 862-1088.

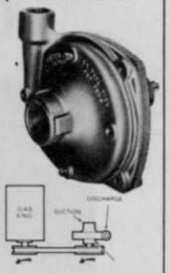
**Tropical Plant Industry Exhibition,** Miami, FL. **Jan. 20-22.** Contact Tropical Plant Industry Exhibition, PO Box 16796, Temple Terrace, FL 33687. (813) 988-7198.

**Pennsylvania Turfgrass Conference** and Trade Show, Hershey Lodge and Convention Center, Hershey, PA. **Feb. 28-Mar. 3.** Contact Christine King, Executive Secretary, PTC, 412 Blanchard St., Bellefonte, PA 16823. (814) 355-8010.


# High speed Hypro Centrifugals

## help you get the job done right!

Whether you're spraying fertilizer or herbicides or insecticides, Hypro Series 9200 pedestal-mount centrifugal pumps give you nozzle pressures to get the job done right! Even with those long discharge lines, Hypro centrifugals deliver. Check 'em out. Rugged, dependable, economical Hypro centrifugal pumps—and a full line of accessories. Send for your free Hypro Sprayer Pump Handbook or pump catalog today.



**Series 9200 Hypro** pedestal centrifugals offer capacities to 130 gpm, handle pressures to 170 psi and speeds to 6000 rpm. Compact, engine driven model features space-saving side-by-side mounting.

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**Hypro Series 9000** gear-driven centrifugals mount directly on 1⅜ inch PTO shafts.

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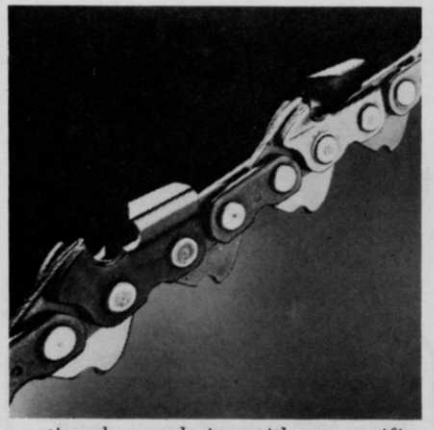
# PRODUCTS

## Chain cuts kickback by 75 percent

The Raker III saw chain from Homelite can reduce kickback forces by as much as 75 percent compared to conventional saw chains without sacrificing cutting and boring performance. The chain comes in 16, 20 and 24-inch lengths. The key to the chain's safety is three instead of one rakers per cutter.



Circle No. 130 on Reader Inquiry Card

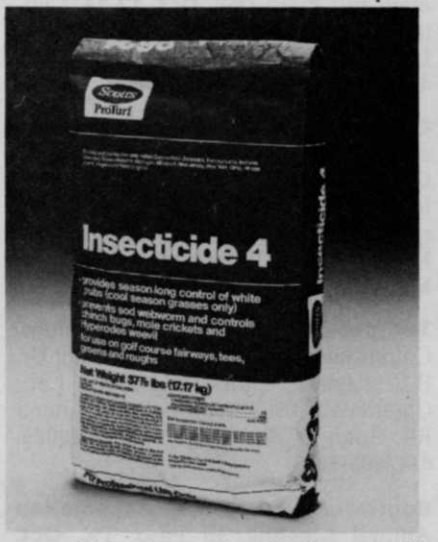
## Front drive Rampage provides economy, utility

Chrysler Corporation adds another gas miser to its truck line with the Rampage, the first American front-wheel-drive small pick-up. It gets an estimated 26 mpg city and 40 mpg highway and can carry a 1,140 lb. payload as well. The truck features a 2.2 liter engine, double-wall box, large disc brakes, and a five-speed manual transmission.

Circle No. 131 on Reader Inquiry Card

## Season-long control of grubs from Scott

Insecticide 4 from O.M. Scott & Sons provides season-long control of grubs as well as control of chinch bugs, mole crickets, sod webworms and Hyperodes weevils. It can be used on a preventative or curative basis on golf course greens, tees, or fairways of Kentucky bluegrass, bentgrass, perennial ryegrass, fine fescue, Poa annua, bermudagrass and St. Augustine.

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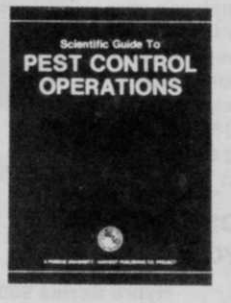
## Wider cut for faster trim mowing

Sensation Corp. maintains easy handling and ruggedness while providing a wider cutting swath. The new 36-inch commercial mower is available with an 8-hp Briggs and Stratton engine or an 11-hp Honda or Briggs and Stratton engine. The durable mower also can be used with two grass catcher models or a sulky.

Circle No. 133 on Reader Inquiry Card


# Scientific Guide To Pest Control Operations




**by Dr. L.C. Truman**
**Dr. G.W. Bennett and**
**Dr. W.L. Butts**

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The SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS is designed to provide a sound basis for studying the scientific aspects of pest control and promote technical competence. It places emphasis on urban and industrial pest problems. This volume also covers the laws and regulations concerning the pest control industry.

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## Compact loader offers 4-wheel drive

The General Inc. L-400 with four-wheel traction and articulated steering lets you work in tight spaces and still

have 53 hp of strength. The unit can haul 5/8 yard of material at one time.

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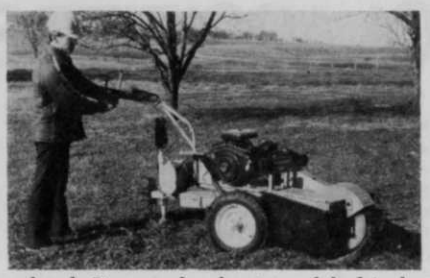

wheel. It can also be towed behind a car or truck.

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## Auger provides replaceable point

Feldman introduces a new replaceable fish tail pilot point for its portable earth auger. According to the company, the fish tail design affords more efficient ground penetration in clay, sandy and stony soils. A 3-hp gasoline engine centrifugal clutch, and low gear ratio are featured. The auger comes in 2, 4, 6, and 8-in. diameters.

Circle No. 137 on Reader Inquiry Card

## Seven horses of replacement power

Kawasaki's FG 300 has been built to provide lower vibration and longer wear for replacement or original

equipment engines. The 7.5 hp, four-cycle engine has heavy duty ball bearings on the crankshaft and a counter-balance shaft for quieter performance.

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## Vermeer introduces handle-bar model

Vermeer's new handle-bar stump cutter features an 18-hp Briggs and Stratton engine. The 410-lb. unit has an electric jack which places pressure on the cutting wheel. Model 618 cuts 30-inches wide and eight-inches below the surface with a 16-inch cutting


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**Put a WHIRLWIND FORCE to work to SWEEP UP LEAVES, LITTER, etc!**

**TAKE-ALONG 'BIG JOB' LOADER**

**HAUL THIS** 16 horsepower Mi-T-VAC on any truck (or trailer we make) and clean up wet or dry problems. Fills dump truck with leaves in 25 minutes!

**Lo-Blo, the Air-BRoom®**

**HEAVY DUTY BLOWER-SWEEPER** helps a small crew gather more leaves, trash, clippings in less time. For details on today's 5 to 45 horsepower models, call Area 216 **947-2344.**

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8 inch hose reaches out 20 feet

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**M-C** MATHEWS COMPANY **lawn genie®**

**Pick-Up Mower**

**The Professional's Choice**

**Complete Lawn and Turf Maintenance in One Machine**

- Mow, thatch, leaf sweep or mulch
- Renovate, clean and pick-up in one pass
- Vacuum action lifts clippings, leaves, twigs and debris into quick dump all metal hopper
- Sized for any job - 36", 48", 60" and 72" cutting widths, engine driven or PTO, lift type or pull type

72" PTO Model

Change cutting knives to thatching blades, or combination of both styles, in seconds with M-C's patented spring loaded hangers.

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## USED EQUIPMENT

**HI-RANGERS AERIAL BASKETS** 65', 57', and 53'. Skyworkers aerial baskets 65', 50', 40'. Vermeer stump cutter 1560,6. Vermeer tree spade 66, TS 44. Asplundh bucket and brush chippers, Bean sprayer, 9 ton trailer. Parkway Tree Service, 12026 W. Cherry, Wauwatosa, Wisc. 53226. (414) 257-1555. TF

**USED GOLF CARS FOR SALE**—All makes and models, 3 & 4 wheel, electric or gas. If we don't have your choice in stock we can get it. Transportation available. Mid-Atlantic Equipment Corp., Collegeville, PA. Call Now! (215) 489-1400. TF

1967 Ford F-600, 42' Skyworker bucket, auxiliary power-air compressor & hydraulic, air at bucket. Also PTO pump. Very good condition. $6,900.00. Lakeside Tree, (216) 486-8836 after 6:30 p.m.

Hi-Ranger Bucket Trucks—90', 70', 65', 52' and 48', also Asplundh, McCabe, Pitman and Skyworker. Brush chippers, Vermeer stumpers, Prentice loaders, Vermeer TS 44 and 66, small cranes. Allied Utility Equipment, Inc., W204 N11509 Goldendale Road, Germantown, Wisconsin 53022, (414) 255-6161 Anytime. TF

50 HP Toro automatic irrigation system with heads and controls for 9 hole course. Phone (517) 463-2372. 10/82

Good used equipment. A must for efficient ROW control. For Sale: Kershaw 10-5 brush cutter; Bombadier track brush cutter. Call (404) 323-0428. 10/82

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**Used Spray Units For Sale**
1,250-gallon stainless steel tanks. Mechanical agitation. FMC 20 gallon/minute pump. Hanney electric reel. Ford F600 and Chevy C60's—'76's, '77's, '78's and '79's.

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**100 ft. ARLO telescopic crane mounted on 1972 Ford. Excellent condition, $15,000. Call (201) 334-4854.** 10/82

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**EQUIPMENT** For operating tree cutting and trimming service includes 1974 IHC dump truck with Prentice Loader; M.F. 50 tractor with scraper and trailer for tractor; Wayne brush chipper; misc trucks and small tools; chain saws etc. Contact Ray at Bank of Galesville (608) 582-2233. Buy it all at a bargain price or items may be purchased separately. 11/82

TREE SPRAYERS AND TRUCKS FOR SALE—John Bean, 1000 gallon tank with 60 gpm pump $9,800. Meyers, with 1000 gallon stainless steel tank 60 gpm pump, like new $14,900. Sewer jet converted tree sprayer, 1000 gallon tank 60 gpm pump $9,500. All three units come with Hanney reels, hose, guns and 200 gpm thrash pumps. 1973—700 series 12' dump truck, $5,700. 1969—750 series, 16' winch truck, dual rear, $4,500. All in excellent condition. For information call Schmiede Tree Expert Co., 351 Terrill Road, Fanwood, New Jersey 07023. (201) 322-9109.

**FOR SALE**—1975 John Bean 60 gal. per minute hydraulic tree sprayer. 1000 gallon stainless steel tank—65 horsepower. Refiller, hose reel, hose and one gun included. $11,000. Call (203) 872-4513 evenings. 11/82

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FOR SALE 7 year established and incorporated commercial landscape maintenance business. Year round cash flow. Located in central N.J. We enjoy one of the highest reputations in our respected field. Serious inquiries only please! Everlasting Lawns, Inc., P.O. Box 358, Cranbury, NJ 08512. 11/82

**ROTOTILLER**—1980 Maschio, Series B, 72", heavy duty. **TREE SPADE**—TS 30, 1980 Vermeer, three point hitch. **50-50 AC TRACTOR**—1979 with loader, 50 h.p., 600 hours. **BRILLION FEEDER**—1980, 5'4". **VERMEER TREE SPADE**—1979, TS 44 A, flotation tires. **LANDOLL 5TH WHEEL TRAILER**—1979, 32', 32,000 lb. GVW, 30,000 lb. wench, hydraulic sliding tandem duals. Removable sides, used 3,000 miles. **MOTOROLA RADIO SYSTEM**—1980, FM, 60 mile radius range, 2 mobiles, base unit and antenna, repeater and antenna, private ultra high frequency. Contact: Linn Cornick, Mount Pleasant, Iowa, (319) 986-6103. 10/82

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**FOR SALE** 1978 Woodchuck 16" brush chipper, Detroit Diesel engine, low hours, with or without 1969 I H 1600 truck with chipbox. Both $9,500. In Minnesota. (612) 437-9463. 10/82

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**GOLF CARTS FOR SALE**—(25) 1976-1979 Harley-Davidson Golf Carts. Good Running Condition. Call John (209) 962-7220 or 962-7883. 11/82

Olathe—MODEL 48 Sweepers for sale, factory demos., new warranty—list $6,000.00, sale price $2,800.00. FOB. Olathe, KS. Toll free 1 (800) 255-6438. 10/82

**2 TREE SPRAYERS FOR SALE**—1,000 gallon tanks, 60 gallon a minute pumps, excellent condition. $9,800 each. Trucks also available for both units. For information call Schmiede Tree Expert Co., Fanwood, NJ 07023. (201) 322-9109.

**SOD-GRASS-SPRIGS** Hy Bermuda 419 & 328 —$1.10/sq. yd., Meyer Z-52 Zoysia—$2.25/sq. yd., Centipede—$1.50/sq. yd., Sprig prices quoted—ship anywhere Bayou Pierre Turf Farms, Carpenter, MS 39050. (601) 885-8281 or 956-5034. TF

**LAWN SEED.** Wholesale. Full line of top quality grasses. Improved bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 2705 Wingate Avenue, Akron, Ohio 44314. Call collect (216) 753-2259. 4/83

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Help Wanted: Golf Pro—Pro Shop Manager—18 hole golf course. Should be P.G.A. member. Would consider retired or semi-retired person. Send resume to: Henry Walters, General Manager, Municipal Recreation Improvement District, Clubhouse Road, Horseshoe Bend, AR 72512. 10/82

**LANDSCAPE MAINTENANCE SALES**—Innovative, expanding landscape company is accepting applications for sales representatives in Dallas, Houston and Oklahoma City markets. Respondents must have experience in landscape maintenance on a technical level, and a comprehensive sales background; Degree in agricultural sciences preferred. Apply to: Maintain Incorporated, Attn: Branch Manager, 2549 Southwell, Dallas, Texas 75229 (214) 241-2202. 11/82

**SALES/MARKETING MANAGER** Rapidly expanding aggressive wholesale/retail firm in southeastern Pennsylvania desires experienced sales/marketing professional. Responsibilities will include present sales solidification and development of major new programs. Background degree preferred. Income commensurate with experience. Employees aware of ad. Reply with resume and requirements to WTT Box 303. (All replies confidential). 10/82

**GENERAL MANAGER** For large steadily expanding metropolitan/suburban interior landscaping corporation in Northeast U.S. We are well established and financed, offering excellent opportunity and rewards commensurate with experience and performance. Position requires high management/administrative skills, business and people skills. Would discuss help in relocation, or absorbing your operation, if applicable. Send resume and salary history in confidence to WTT Box 302. 11/82

## POSITION WANTED

**GARDEN CENTER TURF CONSULTANT/LANDSCAPE DESIGNER/LAWN CARE MANAGER.** Ambitious competent manager seeking employment in one of the above or related position(s). Background from managing vertically integrated family turf nursery. For full and detailed resume, call or write WTT Box 306. Will relocate. 10/82

**GROUNDS MAINTENANCE/LANDSCAPE SUPERVISOR**—Seeks challenging position. Schooling, field application in landscaping design and maintenance. Resume upon request. Jack Pinegree, 303 Old Oak Rd., Newark, Delaware, 19711. (302) 731-4082 8/83

Golf Professional and Superintendent with 15 years extensive experience in the golf business seeking professional/superintendent and/or professional-managers position. Energetic, responsible and innovative individual with complete knowledge and working experience in professional, manager and superintendent fields. Capable of directing all golf course operations. Moderate salary package accepted for right position. Write WTT Box 304.

POSITION WANTED Career minded individual seeks a challenging position as professional facility manager with a growing corporation. Expertise covers all aspects of grounds, housekeeping, golf course, estate, vehicle and facility management. 13 years of experience in northeast. Will relocate. Call (215) 965-2539 or write Box 114, Emmaus, PA 18049. 10/82

## WANTED

**WANTED**—Large Lindig & Royer Soil Shredders. Lewis Equipment Co., 320 Third Street S.W., Winter Haven, Florida 33880 (813) 294-5893. 12/82

9 row Beck Zoysia Plug Planter. Contact: Ed Keeven Sod Co., Inc., R.R. #3, Box 598, O'Fallon, Mo. 63366 (314) 272-5151 10/82

**Director of Horticulture**—Individual with education and experience in tree/shrub care needed to run horticulture division of major lawn care company. Will have technical and operational responsibility. Business experience essential. Excellent salary and benefits. Write WTT Box 307.

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# ADVERTISERS


| Reader Service Number | Page No. |
|---|---|
| 101 Aquatrols Corp. of America, Inc. | 52,55 |
| 102 Atwater Strong | 63 |
| 103 Columbia Car Corp. | CV 3 |
| 104 Cushman | 26,27 |
| 105 Davey Tree | 51 |
| 106 Diamond Shamrock/Ag Chem Div. | 58,59 |
| 107 Dow Chemical U.S.A. | CV 2 & pg 1 |
| 223 Estech, Inc. | 5 |
| 109 Clifford B. Hannay & Son, Inc. | 65 |
| 110 Hypro, Div. of Lear Siegler, Inc. | 61 |
| 222 Jacobsen, Div. of Textron Inc. | 22,23 |
| 112 Lofts Seed, Inc. | CV 4 |
| 127 Lofts Seed, Inc. | CV 4 |
| 113 Mathews Co. | 63 |
| 114 Northrup King Co. | 47 |
| 115 Pennfine Perennial Ryegrass | 31-36 |
| Professional Grounds Management Society | 43 |
| Professional Lawn Care Assc. of America | 49 |
| 116 Ransomes, Inc. | 7 |
| 117 Rhone Poulenc Chemical Co. | 40-41 |
| 118 Royal Coach/Buckner | 66 |
| 119 Ryan Turf Care Equipment | 11 |
| 120 Safe-T-Lawn | 3 |
| 121 Sierra Chemical Co. | 16-17 |
| 122 Stauffer Chemical Co./Ag Div. | 19 |
| 123 The Toro Co. | 39 |
| 124 The Toro Co./Irri. Div. | 9 |
| 125 Vermeer Manufacturing Co. | 21 |
| 126 Woods, Div. of Hesston | 44 |



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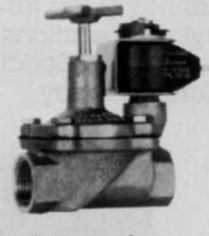

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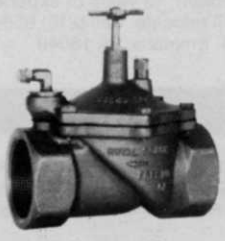

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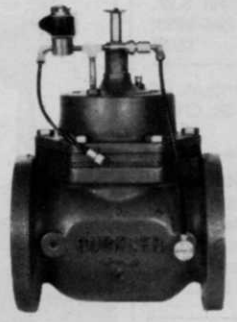

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# NEW PRODUCTS


| Reader Service Number | Page No. |
|---|---|
| 130 Homelite | 62 |
| 131 Chrysler Corp. | 62 |
| 132 O.M. Scott & Sons | 62 |
| 133 Sensation Corp. | 62 |
| 134 General Inc. | 63 |
| 135 Kawasaki | 63 |
| 136 Vermeer Manufacturing Co. | 63 |
| 137 Feldman | 63 |


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# We're not just in the golf car business.

# We're in the golf course business.

Our president, Joseph Noll, looks at golf cars a little differently than other manufacturers do. He's been deeply involved in the *business* end of golf for over 25 years. He has been a country club president, and a volunteer in many club and course organizations. Currently a director and an officer of the National Country Club Association and a director of the Greater Milwaukee Country Club Association, Mr. Noll knows that a golf car is an important, specialized piece of equipment.

And he knows something else: a quality golf car is important to a quality golf course.

In 1982, when Columbia purchased the golf car division of Harley-Davidson, Mr. Noll had the opportunity as president to make this awareness the foundation of something important. Prior to this purchase, an extensive survey of all golf car products was made, and he came to the firm conclusion that Harley-Davidson built the best golf car in the world. And he knew he could make it even better.

## Introducing the Columbia Car Corporation.

Columbia has a single purpose. With the special understanding we have of the role golf cars play in the golf club business, we've chosen to concentrate our efforts toward one end—producing golf cars of uncompromised quality. Every Columbia car coming off the line will deliver what the best club management is demanding today: economy, efficiency, reliability, longevity. That's not just a commitment for the future. It's a rock-solid reality today.

Ours are the only golf cars made in America with an American engine. Every Columbia is manufactured at our plant in Deerfield, Wisconsin, a place where the work ethic that established American manufacturing excellence still thrives. And we've just expanded to an adjacent building giving us 154,000 square feet of total manufacturing space.

## We stand behind what we sell.

We give you a two-year warranty on the drive train of our gasoline powered cars. That's *twice as long* as any other company offers! We have the confidence because we have the products.

Our involvement doesn't stop at the end of the production line. In fact, Columbia has the largest dealer network of any golf car manufacturer. It's also recognized as the finest service organization in the industry. So you can count on fast, expert service wherever your course is located.

## We do more than sell golf cars.

We strive for increased quality to improve performance and dependability. To reduce maintenance costs. To increase user satisfaction. To innovate in the areas of efficiency, comfort, and luxury accessories. To continue to educate and encourage our dealers so that you'll never be kept waiting or wanting.

## Get to know us better.

We're ready to be your number one source for golf cars, and we're anxious for you to know more about Columbia. Our dealers have the details about the golf car company that understands *your* business. Contact the one nearest you, today.

If you have any questions, please call Mr. Noll at his toll-free number, 1 800 222-4653. If you prefer, write to him. Joseph Noll, Columbia Car Corporation, P.O. Box 3069, Madison, WI 53704.

# COLUMBIA

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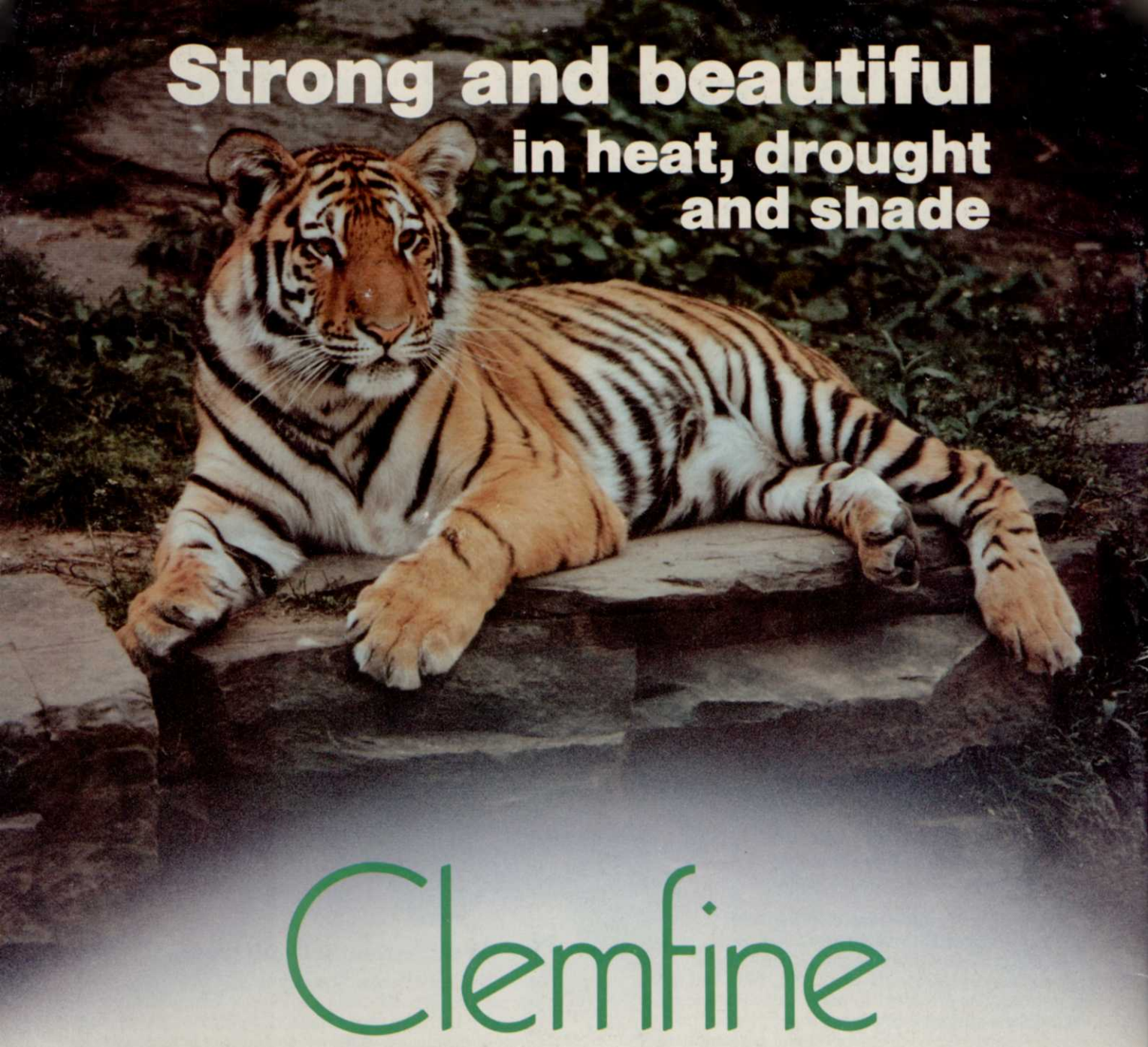


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